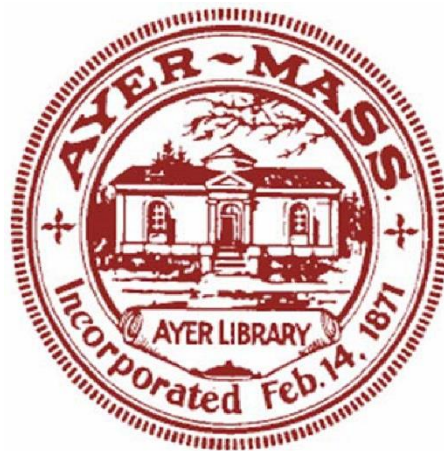


Annual Report Industrial Pretreatment Program

*Ayer, Massachusetts
Department of Public Works*



November 2020

Prepared by:

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INDUSTRIAL PRETREATMENT PROGRAM

ANNUAL REPORT

FOR THE PERIOD OF OCTOBER 31, 2019— NOVEMBER 3, 2020

prepared for:

TOWN OF AYER, MASSACHUSETTS

DEPARTMENT OF PUBLIC WORKS

BROOK STREET

AYER, MASSACHUSETTS 01432

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We acknowledge with thanks and appreciation, the assistance and cooperation extended to us by Mr. Mark Wetzel, P.E., Superintendent of Public Works, Mr. Rick Hudson, the Town of Ayer Wastewater Treatment Facility Foreman and Ms. Pamela Martin, Office Manager.

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EXECUTIVE SUMMARY

This report documents the activities of the Town of Ayer's Industrial Pretreatment Program (IPP) for the period from October 31, 2019 through November 3, 2020. The Town of Ayer continues to administer the IPP in accordance with the Federal requirements of 40 CFR Part 403.12(i) with assistance from Hoyle, Tanner & Associates, serving as the Town's Pretreatment Coordinator's Consultant. Compliance monitoring, annual inspections and self-monitoring reporting have all been conducted in accordance with the approved IPP. The USEPA Pretreatment Annual Report Summary is presented in Appendix A.

An updated windshield survey was conducted on October 21, 2020. There is one dentist in the Town connected to the sewer system that has an amalgam separator and this dentist has provided a self-certification. This one-time certification has been received by the Town to fulfill the requirement as part of 40 CFR Part 441 - Dental Office Point Source Category. All of the Significant Industrial User's (SIUs) have been inspected at least once during this year. All of the SIUs are currently under an unexpired enforceable Industrial Discharge Permit with the Town. The Town continues to monitor grease traps in the Town, as staffing allows. The SIU's wastewater has been sampled once during this reporting period as per the approved IPP.

The priority pollutant scan was conducted at the WWTF on October 2, 2020 in conjunction with the compliance sampling at the SIUs. The toxicity tests performed during this reporting period were all in compliance with the NPDES permit.

The Town has been in full compliance with its NPDES permit with the exception of October 2020 at which time the average monthly phosphorus limit of 0.20 mg/l was exceeded at 0.33 mg/L. Further detail regarding this incident is provided in Section 6 of this report.

BACKGROUND

The Town of Ayer's Wastewater Treatment Facility (WWTF) is designed to treat 1.79 MGD and the Town has the ability to discharge up to 800,000 gpd to the Devens Commerce Center WWTF through the Main Pumping station and on average discharges approximately 100,000 gpd.

The WWTF is an advanced facility which was constructed in the late 1970s and upgraded in 2006 to include a vortex grit system, aeration system modifications, Aquadisk tertiary cloth filters and ultraviolet disinfection.

The WWTF discharges effluent to the Nashua River and must comply with the discharge limits set forth by the National Pollutant Discharge Elimination System (NPDES) permit (Federal number MA 0100013 and State number M-114) pursuant to the Clean Water Act (Federal Act) and the Massachusetts Clean Waters Act (State Act). The most recent issuance of this permit to the Town has an effective date of March 1, 2015. The NPDES permit includes a stringent seasonal phosphorus limit, E. coli testing instead of fecal coliform, and included interim effluent limits for copper, lead and aluminum and now final limits for these parameters. The Town submitted an application for NPDES permit renewal in July 2020.

The Town has been administering its approved Industrial Pretreatment Program since 1991 in accordance with 40 CFR Part 403 and the Town's Regulation of Sewer Use. The purpose of the IPP is to regulate and to prevent the introduction of pollutants into the Town's POTW from industrial users which will:

- *interfere with the operation of the plant or contaminate the sludge;*
- *pass-through the treatment works into receiving waters or the atmosphere or otherwise be incompatible with the POTW; or*
- *hinder opportunities to recycle and reclaim wastewaters and the sludges resulting from wastewater treatment.*

The purpose of this report is to evaluate the status and progress of administering the IPP during the period of October 31, 2019 – November 3, 2020 to meet the above stated goals. Accordingly, the following items will be detailed within this report:

- A list of all industrial users by category.
- Periodic reporting requirements for significant industrial users.
- A summary of compliance and enforcement activities during this period.
- A summary of all pollutant analytic results for influent, effluent, sludge and any toxicity data from the wastewater treatment facility (WWTF).
- A description of all interference and pass-through that occurred during the past year.
- A thorough description of all investigations into interference and pass-through during the past year.
- A description of monitoring, sewer inspections and evaluations which were done during the past year to detect interference and pass-through at the WWTF.
- A description of actions being taken to reduce the incidence of significant violations by the SIUs.
- The date of the adoption of the latest local limits and an indication as to whether or not the Town is under a State or Federal Compliance Schedule that includes steps to be taken to revise the local limits.

1. INDUSTRIAL USERS

1.1 INTRODUCTION

A list of industries by category, as set forth in 40 CFR 403, was developed from those industries connected to the sewer system. A ¹review of the Town's records was conducted to determine if there were any new users. Many small industries and commercial establishments connected to the Town's municipal sewer system discharge only domestic waste to the municipal sewer system, do not have the ability to discharge industrial wastewater to the POTW or discharge small quantities of wastewater that do not impact the POTW. The Town's Pretreatment Coordinator's Consultant checks with the Town personnel to see if any new users have connected to the system during the reporting period. A windshield survey to update existing businesses was conducted on October 21, 2020.

1.2 INDUSTRIAL USERS BY CATEGORY

Table 1-1 in Appendix B provides an updated list of the Industrial/Commercial Users connected to the sanitary sewer system. Three (3) of these industries have been identified as Significant Industrial Users (SIUs) by the composition of their waste stream, the ability to adversely affect the POTW operation and the quantity of flow discharged to the sewer system.

Significant Industrial User

The term Significant Industrial User Means: "(1) All industrial users subject to Categorical Pretreatment Standards under CFR 403.6 and 40 CFR chapter I, subchapter N; and any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process waste stream which makes up 5 percent or more of the average dry weather hydraulic or

organic capacity of the POTW treatment plant; or is designated as such by the Control Authority as defined in 40 CFR 402.12(a) on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)). (2) Upon a finding that an industrial user meeting the criteria in paragraph (t)(1)(ii) of this section has no reasonable potential adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority (as defined in 40 CFR 403.12(a)) may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user."

The businesses have been divided into the following categories:

- 1. Significant Industrial User (SIU) - as per the definition.*
- 2. Commercial User/Restaurant - may discharge small quantity of industrial wastewater, but not significant to POTW.*
- 3. Domestic-sanitary wastewater discharged only, no chance of discharging industrial wastewater to the POTW.*

The SIUs are listed in Table 1-2. The Town also intends to conduct an updated Industrial Wastewater User Survey during the next reporting period to be certain the business data base is accurate in terms of the wastewater discharge quantity and quality from these users.

Table 1-2 Significant Industrial Users			
Permit Number	Industry	Manufacturing Process	Standard Industrial Classification Code (SIC Code)
005	CPF, Inc.	Bottles soft drinks and tea and manufactures water	2086
007	EPIC Enterprises, Inc.	Cans soft drinks/energy drinks	2086
016	Nasoya Foods USA, Inc.	Manufactures tofu products	2099

Each SIU IPP file contains permits, inspection forms, self-monitoring reports, compliance reports, correspondence, spill plans and enforcement activities which are kept in folders that are color coded and kept in chronological order. The Town maintains hard copies of files as well as Excel[®] database sheets to track self-monitoring reports and Town's compliance reports.

Dental Facilities – The Town received the one-time certification from the one dental office connected to the POTW.

1.3 BASELINE MONITORING REPORT

There were no baseline monitoring reports received or reviewed this reporting this year, since there were no new Federal categorical waste streams added this year.

1.4 COMPLIANCE STATUS REPORTING FOR NEWLY PROMULGATED INDUSTRIES

There have been no newly promulgated industries added to the Town's IPP during this reporting period.

1.5 REPORTING REQUIREMENTS

Table 1-3 Self-Monitoring Reporting Requirements			
Permit Number	Industry	Manufacturing Process	Reporting Requirements
005	CPF, Inc.	Bottles Soft Drinks, tea and water	Daily for flow and pH, weekly for BOD ₅ and TSS, monthly for temperature
007	EPIC Enterprises, Inc.	Cans Soft Drinks	Daily for flow and pH, weekly for BOD ₅ and TSS, monthly for temperature
016	Nasoya Foods USA, Inc.	Manufacturer of tofu	Daily for flow and pH, 2/week for BOD ₅ and TSS, monthly for temperature

The SIU self-monitoring reports have been submitted on time and contain the proper chain of custody sheets and proper certification. The Town has also included a requirement that all SIUs report their expected weekend daily wastewater discharge by noon on Friday of each week to the IPP Coordinator's Consultant by email. This allows the Town to plan for weekend flows when staffing at the WWTF is minimal. Nasoya is also required to submit a summary of effluent results in an electronic spreadsheet every two weeks to the Town.

1.6 LOCAL LIMITS

All of the SIUs and IUs must comply with the Town's local limits. The limits are concentration-based limits with the exception of BOD₅ and TSS which are a mass-based limit and are included in each individual permit. The Town is conducting a reevaluation of its local limits in accordance with the NPDES permit. The work was expected to be completed during reporting period, however, the reevaluation has been delayed due to competing resources due to the Covid-19 and is now expected to be completed during the next reporting year.

2. COMPLIANCE AND ENFORCEMENT

2.1 INTRODUCTION

Essentially, three forms of compliance monitoring are used by the Town and are further described below:

- User self -monitoring, conducted by the industry and reported to the Town
- Compliance monitoring, conducted by the Town as a check on self-monitoring
- SIU inspections, conducted by the Town

As part of the compliance and enforcement activities, the Town performed SIU compliance monitoring at the sampling location specified in each SIU's Industrial Discharge Permit. All of the sampling and analysis is performed in accordance with Federal Guidelines given at 40 CFR Part 136 by a contract laboratory.

Compliance monitoring is used as a check of the self-monitoring reports submitted by the SIUs, to make certain that proper sampling techniques are employed and be certain the SIUs are complying with their industrial discharge permit effluent limits. The Town's compliance monitoring at the SIUs was conducted on October 2, 2020, which was a Friday. This day was selected to see if any different production was occurring prior to a weekend. The SIUs were all sampled for their permitted parameters. The Town also performed abbreviated compliance inspections in October and November 2020 due to the Covid-19 pandemic. The production areas were toured only briefly.

2.2 USER SELF-MONITORING

Each month, the SIUs are required to report the results of their sampling to the Town on a form approved by the Town and with the proper USEPA certification stating the sampling results are true,

accurate and complete. The self-monitoring reports are now being submitted on a monthly basis with each week's data included. The weekly data is provided more accurate information for the SIUs discharges. The data is logged into the Town's IPP files primarily electronically for each SIU. The reports from the SIUs have been on time, signed properly with the proper certification, are on the proper form and include the proper chain of custody sheets. Because the SIUs are testing so frequently there has been more identifiable permit exceedances. These permit exceedances have been enforced upon by the Town.

2.3 COMPLIANCE MONITORING

The Town's compliance monitoring of the SIUs is performed to verify the information received on the self-monitoring reports is accurate. This is to be certain that the characteristics of the waste stream are similar to that which is being reported by the SIUs. Unannounced sampling is performed at the sampling location specified in the user's industrial discharge.

The Town has retained the services of EST of Needham, Massachusetts to perform all of the sampling work and Alpha Analytical of Westborough, Massachusetts to perform the laboratory analysis associated with the Town's IPP. Both of these firms use the proper sampling techniques and analysis protocol, using the appropriate Chain of Custody sheet as per 40 CFR Part 136. The results of the compliance monitoring are included in Appendix C. All SIUs were in compliance during the Town's compliance monitoring.

Table 2 –1		
Town’s Compliance Monitoring		
Permit Number	Industry	Date
005	CPF, Inc.	October 2, 2020
007	Epic Enterprises, Inc.	October 2, 2020
016	Nasoya Foods, Inc.	October 2, 2020

2.4 SIU INSPECTIONS

An unannounced inspection was conducted at the SIUs according to the dates shown in Table 2-2.

Table 2-2		
Town Compliance Inspection Dates		
Permit Number	Industry	Compliance Inspection Date
005	CPF, Inc.	November 3, 2020
007	EPIC Enterprises, Inc.	November 3, 2020
016	Nasoya Foods, Inc.	October 21, 2020

At the recommendation of the USEPA, the Town updated the inspection form to be used during SIU compliance inspections. A copy of the inspection form is maintained in each SIU file and follow up recommendations made. No additional inspections were conducted this year due to Covid-19.

2.5 COMPLIANCE SCHEDULES

When a violation of the industrial discharge permit is detected, by either the SIU or the Town, follow-up sampling is conducted. All of the SIUs are familiar with the slug notification form to be submitted

should an effluent violation occur. Follow-up sampling is required within 30 days of the violation. If it appears that the violation has not been corrected, the Town will meet with the SIU to develop a reasonable return to compliance schedule. The schedule is typically incorporated into an Administrative Order with specific deadlines to be met to return to compliance. There have been no compliance schedules warranted or developed this reporting year.

2.6 NOTICES OF VIOLATION

The Town uses the various enforcement actions in accordance with the approved Enforcement Response Plan to ensure compliance. The Notice of Violation is used to document a known violation. Minor violations such as late reports or a non-frequent violation with no impact to the WWTF are addressed with an email, a phone call or often a Notice of Violation. Nine (9) Notices of Violations were issued this reporting period and can be found in Appendix F.

CPF, Inc. – 3

EPIC Enterprises, Inc. -2

Nasoya Foods, Inc. - 4

2.7 ADMINISTRATIVE ORDERS

If a violation continues or the violation has significant impact on the WWTF, the Town issues an Administrative Order (AO) and often includes a penalty.

2.8 CRIMINAL/CIVIL SUITS

No criminal or civil suits have been brought against any of the SIUs.

2.9 PENALTIES OBTAINED

There were no penalties collected during this reporting year.

3. LIST OF SIGNIFICANTLY VIOLATING INDUSTRIES

3.1 INTRODUCTION

The Federal requirements provide for at least annually providing public notification of industrial users which during the previous 12 months were significantly violating applicable pretreatment requirements or categorical standards. There were no industries that needed to be published in the largest circulated local newspaper in accordance with the Federal requirements. For the purpose of this provision, an SIU is in significant non-compliance if its violation meets one or more of the following criteria:

1. *Chronic violations of wastewater discharge limits, defined here as those in which sixty-six percent or more of all of the measurements taken during a six-month period exceed (by any magnitude) the daily maximum limit or the average limit for the same pollutant parameter;*
2. *Technical Review Criteria (TRC) violations, defined here as those in which thirty-three percent or more of all of the measurements for each pollutant parameter taken during a six-month period equal or exceed the product of the daily maximum limit or the average limit multiplied by the applicable TRC (TRC = 1.4 for BOD₅, TSS, fats, oil and grease and 1.2 for all other pollutants except pH.)*
3. *Any other violation of a pretreatment effluent limit (daily maximum or longer-term average) that the Control Authority determines has caused, alone or in combination with other discharges, interference or pass-through (including endangering the health of POTW personnel or the general public);*
4. *Any discharge of a pollutant that has caused imminent endangerment of human health, welfare or the environment or has resulted in the POTW's exercise of its emergency authority under paragraph (f)(1) of this section to halt or to prevent such a discharge;*
5. *Failure to meet, within 90 days after the scheduled date, a compliance schedule milestone contained in a local control mechanism or enforcement order for starting construction, completing construction, or attaining final compliance;*
6. *Failure to provide, within 30 days after the due date, required reports such as baseline monitoring reports, 90-day compliance reports, periodic Self-monitoring reports and reports on Compliance with compliance schedules;*
7. *Failure to accurately report non-compliance;*
8. *Any other violation or group of violations, which the Control Authority determines, will adversely affect the operation or implementation of the local pretreatment program.*

3.2 SIGNIFICANT NON-COMPLIANCE EVALUATION

In accordance with the Federal Requirements, the significant non-compliance evaluation has been performed in accordance with the rolling quarters method:

Reporting Quarters:

- I June 1, 2019 - November 30, 2019
- II September 1, 2019 - February 28, 2020
- III December 1, 2019 - May 31, 2020
- IV March 1, 2020 - August 31, 2020

Each SIU's self-monitoring reports and the Town's compliance reports are reviewed for compliance with the Industrial Discharge Permit for each parameter. If the number of samples that are not in compliance with the Industrial Discharge permit exceed the criteria in the aforementioned section, then that SIU is in significant non-compliance for a given quarter. The Town has worked closely with the SIUs to be certain that they conduct follow-up sampling in the given quarter so that the percentage of samples that are not in compliance might remain below the threshold to qualify for SNC. This has proven to be effective for keeping the SIUs out of SNC in the past and will continue. The SIUs sample their waste streams at the beginning of each month to allow time for the laboratory to report the results and to give the SIUs time to conduct follow up sampling should a violation be detected. Table 3-1 summarizes the Significant Non-Compliance Evaluation.

Table 3-1						
Significant Non-Compliance Evaluation (SNC)						
Permit Number	Industry	Categorical Industry	I June 1, 2019- Nov. 2019	II Sept. 1, 2019- Feb. 2020	III Dec. 1, 2019- May 2020	IV March 1, 2020- August 31, 2020
005	CPF, Inc.	Not in SNC	Not in SNC	Not in SNC	Not in SNC	Not in SNC
007	Epic Enterprises	Not in SNC	Not in SNC	Not in SNC	Not in SNC	Not in SNC
016	Nasoya Foods, Inc.	Not in SNC	Not in SNC	Not in SNC	Not in SNC	Not in SNC

4. INDUSTRIAL PRETREATMENT PROGRAM EFFECTIVENESS

4.1 INTRODUCTION

The overall administration of the Town's IPP has been effective in protecting the receiving waters of the WWTF, the Nashua River, the health and welfare of the general public, as well as safeguarding the efficient operation of the WWTF and the safety of the WWTF personnel. The Town has been sending flow to the Devens WWTF which has helped to manage the hydraulic and a portion of the organic loads to the Ayer WWTF.

4.2 FUNDING

The Town had sufficient funds to administer the IPP from November 2019 through December 2020. All of the costs associated with the Town's IPP are reimbursed by the SIUs. Costs of POTW operation and maintenance directly attributed to SIU violation are also passed on to the SIUs for reimbursement. These costs may include pump repair costs, wet well pumping of pumping stations and labor costs for addressing blocked sewers or upsets and alarms at the pumping stations and the WWTF directly attributed to an SIU non-compliant discharge.

4.3 STAFFING

It is expected that the staffing required to properly administer the Town's IPP will not change within the next year. Based on Town Planning Board information, it is unlikely that the Town will see any new SIUs discharge to the municipal sewer system over the next year.

4.4 COMPUTER PROGRAM

The Town uses an excel spreadsheet database for the IPP files. Essentially the database does the following:

- Creates a file for each industrial user which contains information pertinent to the user such as company name, address, permit number and industrial classification.
- Maintains an annual file of monitoring data to determine a user's compliance with local pretreatment limits at any time during the year.

- Maintains records of enforcement activity.
- Maintains a spill prevention plan for each SIU which includes material safety data sheets for raw materials which assist in identifying any potentially harmful chemicals and their quantities to the POTW.

The WWTF's performance is also tracked each month from Daily Monitoring Reports (DMRs). Priority pollutant scans are conducted annually in order to compare influent loadings to the Maximum Allowable Headworks Loading (MAHL) to be sure the MAHL is not exceeded as well as the Federal and State water quality standards, sludge standards and the NPDES permit limits. Quarterly toxicological data is also maintained in a database.

4.5 ORDINANCES

The Town currently has in place the Regulation of Sewer Use which includes the Industrial Pretreatment Program requirements and the existing local discharge limits. The Regulation of Sewer Use has been revised to include the Streamline Regulations and the adopted BOD₅ and TSS Maximum Allowable Industrial Loading limits (MAIL). The Regulation of Sewer Use is currently under review by the Town's attorney and it is expected to be approved by the Board of Selectmen during the next reporting period.

4.6 REGULATIONS

The Town did not make significant modifications to the Industrial Pretreatment Program during this reporting period.

5. WWTF SAMPLING PROGRAM

5.1 INTRODUCTION

The annual priority pollutant sampling at the WWTF, as part of the IPP, was conducted by the independent sampling company EST of Needham, Massachusetts and Alpha laboratories of Westborough, Massachusetts. The following parameters are sampled for at least annually at the influent, effluent and sludge.

- | | | |
|--------------|------------------|----------------------------------------------------------|
| • Aluminum | • Lead | • Thallium |
| • Arsenic | • Mercury | • Zinc |
| • Cadmium | • Nickel | • Chromium Hexavalent |
| • Chromium | • Silver | • Cyanide |
| • Copper | • Selenium | • Total Toxic - Organics (TTO)
/Pesticides/Herbicides |
| • Phosphorus | • oil and grease | • BOD ₅ and TSS |

Flow, temperature and pH were checked during the annual sampling event and are also checked daily by the WWTF personnel.

5.2 SAMPLING AT THE WWTF

The Town's sampling and laboratory consultant collected twenty-four-hour composite samples at the influent, the effluent and sludge and used grab samples for parameters that may not be collected as 24-hr. composite samples such as chromium hexavalent, cyanide, volatile organics, semi- volatile organics and oil and grease. The sampling data is used to determine if the MAHL is at a threshold that may allow for interference or pass-through or cause issues with sludge disposal practices.

All of the sampling and analysis was conducted in accordance with 40 CFR Part 136 and a summary

of the data is presented in Appendix D. Detention times through the WWTF (7 hrs.) were considered so as to provide a representative sampling of the fate of each pollutant as it passes through the WWTF. Annual 2020 priority pollutant sampling data indicated the existing MAHL is not being exceeded, with the exception of silver. Historically, over the last three years, the existing silver MAHL has not been exceeded. Further investigation indicated a low enough detection level was not used for the 2020 influent silver sample. When ½ the detection level was used to calculate the silver loading, the MAHL appeared to be exceeded. The Town will be sure that low enough detection levels are used during the next annual priority pollutant scan. In addition, a new MAHL will be calculated during the ongoing local limits reevaluation. The effluent for all the priority pollutant parameters is below the Federal water quality standards taking into account the dilution factor of the Nashua River (13.6). The sampling of the sludge indicated all data was below detection levels and the standards for sludge surface disposal and incineration in Massachusetts. Raw data is included in Appendix D.

2020 Priority Pollutant Scan															
10/2/20															
								WQ	WQ	WQ w/ dilution Acute (13.6)	WQ w/ dilution Chronic (13.6)				
Parameter	FLOW	Ex. MAHL	INFLUENT	INFLUENT	Ex. MAHL EXCEEDANCE	60 %	EFFLUENT	Acute	Chronic			Exceeded	Exceeded	SLUDGE	Most Stringent
	MGD	#/day	(mg/l)	#/day		MAHL	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	Acute	Chronic	(mg/kg)	(mg/kg)
Aluminum	1.250	-	0.0500	0.521	No	-	0.0500	0.7500	0.0870	10.2000	1.1832	No	No	ND	17,500.00
Arsenic	1.250	13.200	0.0320	0.334	No	3%	0.0025	0.3400	0.1500	4.6240	2.0400	No	No	ND	497.00
Cadmium	1.250	0.050	0.00250	0.026	No	52%	0.0025	0.0008	0.0001	0.0109	0.0014	No	No	ND	1,231.00
Chromium	1.250	1.260	0.0050	0.052	No	4%	0.0050	0.1830	0.0630	2.4888	0.8568	No	No	ND	3,874.00
Chromium Hexavalent	1.250	-	0.0050	0.052	-	-	0.0050	-	-	-	-	-	-	-	-
Copper	1.250	0.670	0.0300	0.313	No	47%	0.0050	0.0056	0.0041	0.0766	0.0558	No	No	ND	-
Lead	1.250	0.460	0.00500	0.052	No	11%	0.0050	0.0238	0.0005	0.3240	0.0068	No	No	ND	2,211.00
Mercury	1.250	0.005	0.0001	0.001	No	-	0.0001	0.0014	0.0008	0.0190	0.0105	No	No	ND	55.23
Nickel	1.250	3.530	0.01250	0.130	No	4%	0.01250	0.2060	0.0230	2.8016	0.3128	No	No	ND	43,179.00
Selenium	1.250	7.680	0.0050	0.052	No	1%	0.0050	-	0.0050	-	0.0680	No	No	ND	100.00
Silver	1.250	0.030	0.0035	0.036	Exceeded	122%	0.0035	0.0027	-	0.0367	-	No	No	ND	-
Thallium	1.250	9.040	0.0100	0.104	No	-	0.0100	-	-	-	-	No	No	ND	-
Zinc	1.250	1.010	0.05700	0.594	No	59%	0.025	0.053	0.053	0.7208	0.7208	No	No	ND	-
Cyanide	1.250	0.940	0.0025	0.026	No	3%	0.005	0.02	0.0052	0.2992	0.0707	No	No	-	
Oil and grease (mg/L)	1.250	-	2.00	20.850	No	-	2	-	-	-	-	-	-	ND	
TSS	1.250	3,847.00	120.00	1,251.00	No	33%	0	30	30	-	-	No	No	-	
BOD	1.250	7,675.00	180.00	1,876.50	No	24%	2	30	30	-	-	No	No	-	
P	1.250	-	2.83	29.503	No	-	0.137	0.2	0.2	-	-	No	No	16,000.00	
Nitrogen Ammonia	1.250	-	14.80	154.290	No	-	0.11	-	-	-	-	No	No	-	
TTOs	1.250	-	0.94	9.800	No	-	0.0178	-	-	-	-	No	No	-	

6. INTERFERENCE AND PASS-THROUGH

6.1 INTRODUCTION

Interference is defined as a discharge by an industrial user which, alone or in conjunction with discharges by other sources inhibits or disrupts the POTW, its treatment process or processes, use or disposal and which is a cause of violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal by the POTW in accordance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including state regulations contained in any State sludge management plan prepared pursuant to Subtitle D of the SWDA), the Clean Water Act, the Toxic Substances Control Act, and the Marine Protection Research and Sanctuaries Act.

Pass-through is defined as the discharge of pollutants through the POTW into navigable waters in quantities or concentrations which, alone or in conjunction with discharges from other sources, are a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).

Overall, the Town had a very good year in terms of NPDES compliance. There was one instance of Interference and pass-through that occurred at the very end of this pretreatment reporting period on October 20, 20020. Early on Tuesday October 20, 2020, the Town noticed a milky like wastewater at the WWTF influent which appeared to not settle very well. The Town's operators went to Nasoya

as this milky waste stream had been seen at Nasoya in the past and was also previously witnessed at the influent of the WWTF. The Town collected a grab sample from the Nasoya discharge. The Town then called the Pretreatment Coordinator's Consultant who contacted Nasoya personnel and called Cambrooke Foods as well. Nasoya indicated that there appeared to be nothing out of the usual in terms of production or the pretreatment system operation. The Pretreatment Coordinator Consultant made an onsite inspection at Nasoya the next day on October 21, 2020 at which time the DAF solids appeared grey and ash like rather than the typical rust colored and fluffy. Photographs of the DAF were taken for the SIUs file. At the time of the inspection, Nasoya was hauling approximately 5-8,000 gallon tankers of wastewater to other area WWTFs while Nasoya was working on the upgrade to the pretreatment system. Nasoya did not know what caused the difference in the DAF wastewater appearance, but apparently the PLC was out of order due to a power outage and there was only one aeration blower working. There may have also been additional production cleaning several days prior. Nasoya's operator intended to investigate further.

The Town analyzed the sample it took on October 20, 2020 and the soluble BOD₅ was 543 mg/L. Nasoya throttled back on their wastewater discharge to assist the Town with influent flows.

Nasoya subsequently submitted the bimonthly self-monitoring report which indicated they were out of compliance for BOD₅ on this day. The permit limit for BOD₅ is 750 lbs./day and the self-monitoring report indicated the discharge was 759 lbs./day. In addition, Nasoya provided the requested fact sheet for this incident.

Nasoya Fact Sheet 10/22/2020

Investigate

a	Pretreatment system performance	The Wwtp is working like has for the last 1.6 years I have been here. I am looking forward to getting the primary filter on-line.
b	Additional cleaning chemical used in plant	Normal production cleaning on Friday night 10/16, did an additional cleaning Sat 10-3 -using first caustic to break up the protein and then acid to neutralize,
c	An estimate of additional water used due the extra cleaning you indicated Nasoya performed	There was no additional water since there was no production
d	Changes in production (type or quantity)	Production output is the same as usual. It is all tofu
e	Changes to routine cleaning schedule	There may be a bit more water from cleaning since our QA/QC team is working with a new manager, we see that the average flow has gone up from 145 to 150.
f	Changes in the type or quantity of coagulant used for the pretreatment system	No Change
g	Evaluation of the bio tower performance any noted issues	Looking closely at the data the BioT are working normally.

The Town has prepared an Administrative Order in accordance with the Enforcement Response plan which has been issued in the next annual reporting period which included more detailed reporting on its daily site inspection sheets of the pretreatment system operation.

7. INVESTIGATION INTO INTERFERENCE AND PASS-THROUGH

The Town contacts the SIUs immediately by email and telephone, if possible, as soon as there is any suspicion of anything atypical in appearance or quantity at the headworks which may lead to interference or pass through. The SIUs review their log sheets on production and clean- up activities to determine if there has been a spill, operator error and/or mechanical malfunction that has resulted in a slug discharge.

An investigation into a milky white discharge was made on October 21, 2020 at Nasoya and at Cambrooke Foods. Cambrooke Foods was eliminated from further investigation after speaking with representatives regarding the wastewater discharge on October 20, 2020.

The Town will continue to work with the SIUs on enhancing documenting of the quantity of cleaning chemicals used during special production cleanings.

8. MONITORING AND INSPECTION FOR INTERFERENCE AND PASS-THROUGH

The Town monitors regularly for the detection of interference and pass-through at the WWTF through its Daily monitoring reports. When influent loads to the Town's WWTF are noticed that appear atypical or out of the typical range of influent flows and loadings, the IPP Coordinator's Consultant is immediately contacted and then the SIUs are contacted to be sure that all SIUs are meeting their Industrial Discharger Permit. The Town has worked diligently on relationships with each of the SIUs primary contact personnel.

The Town collected an influent sample on October 20, 2020 and tested the sample for soluble BOD₅. Working with Nasoya helped to reduce the flow to the WWTF and allow the filters to recover to meet then meet the NPDES Phosphorus limit.

9. ACTIONS TAKEN TO REDUCE SIGNIFICANT NON-COMPLIANCE

9.1 INTRODUCTION

The following outlines the activities by the SIUs during this reporting period as witnessed during the annual inspections.

9.2 CPF, INC.



CPF Main Processing Facility



CPF, Inc. Monitoring Outfall

CPF continues to submit their self-monitoring report monthly rather than quarterly. The more frequent submittal of the self-monitoring reports has allowed the Town to more readily identify any permit exceedances, rather than wait for a quarterly submittal.

CPF, Inc. also continues to improve upon the maintenance of the pH neutralization system by cleaning probes more frequently to assure the pH charts that are submitted are accurate. CPF has taken steps to upgrade the pH neutralization system to a less labor-intensive system and has hired a consultant to evaluate the pH neutralization station.

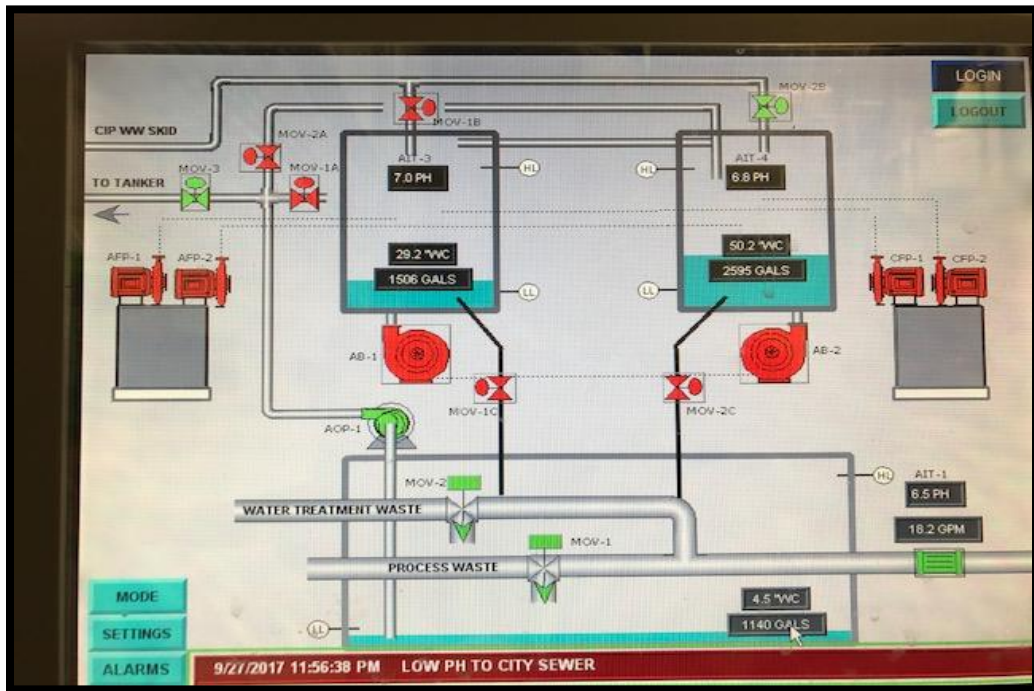
9.3 EPIC ENTERPRISES, INC.



EPIC Enterprises, Inc. -Pretreatment Facility



EPIC Enterprises, Inc. - pH Monitoring System



EPIC Enterprises, Inc. SCADA System

Epic Enterprises, Inc. had an issue with cleaning the inhouse wastewater tank and will increase the monthly cleaning schedule of this tank to avoid the noted permit exceedances.

9.4 NASOYA FOODS, INC.



Nasoya Foods's Main Processing Facility

This industry reports a daily walkthrough inspection report sheet indicating the condition of the pretreatment system and also submits self-monitoring spreadsheet to the Town on a bi-weekly basis. The pretreatment system has been effective in meeting the industrial discharge permit. Nasoya had been working diligently to remain in compliance throughout this reporting period, however, malfunctions at the DAF pretreatment system have caused several permit exceedances over this reporting period. Nasoya has been collecting adequate samples to keep this industry out of Significant Non-Compliance.



Nasoya Foods's Pretreatment System (DAF)



Nasoya Foods's typical discharge over the Weir



Nasoya Foods's High Strength Whey Segregation Tank

9.5 TOWN OF AYER

The Town has focused on several items to reduce the instances of Non-Compliance during this reporting period:

- The Town required Nasoya to update its Spill plan which was submitted on June 2, 2020.
- The use of texting personnel in charge at Nasoya if there is an upset for a more immediate response.

10. LOCAL LIMITS

10.1 INTRODUCTION

The Town developed and the USEPA approved the existing Town's local limits in June 1993. The Town subsequently adopted the local limits and incorporated them into the Sewer Use Regulation in 1998. The local limits have not been updated since this time, with the exception of BOD₅ and TSS.

Typically, the reassessment of local limits is conducted when a new NPDES permit is issued. However, when the Town's previous NPDES permit was issued in February 2006, the WWTF was being upgraded for phosphorus removal and other mechanical/electrical upgrades and the Town requested that a revised Maximum Allowable Headworks Loading (MAHL) be conducted once construction was completed to yield an accurate picture of how pollutants are treated at the WWTF based on the new WWTF upgrade. Shortly after the upgrade was completed, the Town did conduct a HWLA in 2007 and submitted this report to the USEPA for review and approval. The Town never received review comments for this document. Therefore, existing local limits remained in place.

In response to growth from the Significant Industrial Users (SIUs) over the last several years, the Town conducted an organic capacity evaluation at the WWTF in September 2014 for BOD₅ and TSS to see if these pollutants could be allocated on a pounds per day basis to those SIUs that required these loadings. The USEPA approved Hoyle, Tanner's analysis in January 2014 and the SIUs now currently have a mass loading limit for BOD₅ and TSS in their permits.

10.2 LOCAL LIMITS

The current local limits appear to be protecting the POTW for pass-through, interference, sludge and water quality. The MAHL have not been exceeded based on the existing MAHL.

In the recent Pretreatment Compliance Audit conducted in September 2018, the USEPA is requiring the Town to complete a more detailed reevaluation of the MAHL and local limits so to reflect existing conditions at the WWTF current environmental criteria, including sludge disposal practices, and changes that have occurred at the SIUs. Hoyle, Tanner is preparing this reevaluation of local limits for the Town and once approved by the USEPA, the Maximum *Industrial* Allowable Loading (MAIL) and the subsequent local limits will be then included in the updated Regulation of Sewer Use. Due to the COVID-19 pandemic the local limits study has been delayed but is expected to be complete in the next reporting year.

APPENDIX A

ANNUAL REPORT SUMMARY

ANNUAL REPORT SUMMARY

Control Authority Name: Town of Ayer
Address: Brook Street
State/Zip: Massachusetts 01432
Coordinator Name: Mark Wetzel, P.E., Superintendent
NPDES Permit No.: MA 0100013

Reporting Period Start Date: October 31, 2019
Reporting Period End Date: November 3, 2020

Total Number of SIUs: 3

Total Number of CIUs: 0

SIGNIFICANT INDUSTRIAL USER COMPLIANCE STATUS

Number of CIUs Submitting BMRs/Required: 0
Number of CIUs Submitting 90-Day Compliance Reports/Required: 0

Number of SIUs in Significant Non-compliance with Pretreatment Compliance Schedules: 0
Number of SIUs in SNC with Self-Monitoring Requirements: 0

Number of SIUs in Significant Non-compliance for either violating effluent or reporting requirements: 0

Number of SIUs in SNC with Reporting Requirements: 0

Number of SIUs in SNC with Effluent requirements: 0

COMPLIANCE MONITORING PROGRAM

Number of SIUs without active (expired) permits: 0

Number of SIUs with permits expired for 180 days or more: 0

Number of SIUs (both) inspected and sampled by the POTW in the past 12 months: 3

Number of SIUs in SNC not sampled/ not inspected in the past 12 months: 0

Number of SIUs in SNC with Self-monitoring and not inspected and not sampled in the past 12 months: 0

ENFORCEMENT ACTIONS

Number of Compliance Schedules issued: 0

Number of Notices of Violation issued to SIUs: 9

Number of Administrative Orders Issued to SIUs: 0

Combined total of Administrative Orders and Notices of Violations: 9

Civil Suits Filed against SIUs: 0

Criminal Suits Filed against SIUs: 0

Combined Total of Civil Suits and Criminal suits: 0

Number of SIUs published in the Newspaper as Significant Violators: 0

Number of SIUs from which penalties were collected:

Total Amount of Penalties Collected: \$ 0

Number of SIUs subject to any enforcement Action: 0

APPENDIX B

INDUSTRIAL/COMMERCIAL USERS

Permitted	Industry	Address	Process
Not Permitted	McDonald's	At rotary	Restaurant
Not Permitted	Wendy's	Barnum Road	Restaurant
Not Permitted	Ayer Grove Pond Treatment Plant	Barnum Road	Town Water Treatment Plant
Not Permitted	JP Sullivan Apple Co.	Barnum Road	Process Apples
Not Permitted	Academy Glass	Bishop Road	Glass Company
Not Permitted	Tulco	Bishop Road	Business
Not Permitted	Ultimate Car Care	Bishop Road	Car detail
Not Permitted	Eckel	Bishop Road	Noise Control
Not Permitted	Hood	Bishop Road	Distribution
Not Permitted	AMSC	Blighe Street	Business
Not Permitted	Defense Systems	Blighe Street	Business
Not Permitted	North East Recycling	Blighe Street	Business
Not Permitted	Sylvania Standard Electric	Central Avenue	Office
Not Permitted	M. Schwartz & Sons	Central Avenue	Business
Not Permitted	Central Collision	Central Avenue	Auto Body
Not Permitted	N. American Moving	Central Avenue	Truckers/Movers
Not Permitted	Cooper Tires	Central Avenue	Tire Shop
Not Permitted	Ross Fitness Center	Central Avenue	Gym
Not Permitted	Pinards	Central Avenue	Florist
Not Permitted	Nashoba Valley Express Co.	Central Avenue	Office
Not Permitted	Central Ave. Collision	Central Avenue	Auto Body
Not Permitted	Westford Post	Central Avenue	Video Store
Not Permitted	Head Quarters	Central Avenue	Hair Salon
Not Permitted	Verizon	Central Avenue	Office
Not Permitted	Nashoba Club Pizza	14 Central Avnue	Restaurant
Not Permitted	Cambrooke Foods	Copeland Drive	Manufactures Minute Protein Foods
Permitted	CPF, Inc.	Copeland Drive	Manufactures Pepsi/Water
Permitted	EPIC Enterprises	Copeland Drive	Manufactures Pepsi Products
Not Permitted	Hawks Nest	Devens Plaza	Market

Permitted	Industry	Address	Process
Not Permitted	Devens Pizza and Deli	Devens Plaza	Restaurant
Not Permitted	Pit Stop Barber	Devens Plaza	Barber
Not Permitted	Deven Variety	Devens Plaza	Retail
Not Permitted	Ruby's Donuts	Devens Plaza	Donut shop
Not Permitted	Ayer Beer and Wine	Devens Plaza	Retail
Not Permitted	Maria's School of Dance	Devens Plaze	Dance Studio
Not Permitted	Taco Bell	E. Main Street	Business
Not Permitted	Rte 2A Auto Sales	Fitchburg Road	Auto Sales
Not Permitted	Lorden Oil	Fitchburg Road	Oil Company
Not Permitted	Flagg Tree Service	Fitchburg Road	Tree Service
Not Permitted	Ayer Auto Sales	Fitchburg Road	Auto Sales
Not Permitted	Advance Vacuum Systems	60 Fitchburg Road	Manufacture of Vacuum Systems
Not Permitted	Anderson Funeral Home	Fitchburg Road	Funeral Home
Not Permitted	Turbo Lube Autowash	Fitchburg Road	Car Wash
Not Permitted	AVS	Fitchburg Road	Manufacturer of Vacuum Systems
Not Permitted	Ayer Motor Inn	Fitchburg Road	Motel
Not Permitted	R. Murray Knives	Groton Harvard Road	Knife Dealer
Not Permitted	Nashoba Valley Medical Center	200 Groton Road	Health Care
Not Permitted	Nashoba Valley Nursing Home	Groton Road	Nursing Care
Not Permitted	Exxon	Harvard Road	Gas Station
Not Permitted	All Town Fresh	Harvard Road	Gas Station/restaurant
Not Permitted	Mobil Service Station	Main Street	Service Station
Not Permitted	Santander Bank	Main Street	Bank
Not Permitted	Antiques	Main Street	Antiques
Not Permitted	Library	Main Street	Library
Not Permitted	Town Hall	Main Street	Town Hall
Not Permitted	Mary's Beauty Salon	Main Street	Salon
Not Permitted	Water colors	Main Street	Shop
Not Permitted	Flowers by Stella	Main Street	Shop

Permitted	Industry	Address	Process
Not Permitted	Ice Cream	Main Street	Shop
Not Permitted	The cottage	Main Street	Shop
Not Permitted	Osqwa	Main Street	Restaurant
Not Permitted	Markohls	Main Street	Distribution
Not Permitted	North Middlesex Bank	Main Street	Bank
Not Permitted	Pampered Pets	Main Street	Shop
Not Permitted	Ristorante Italia	Main Street	Restaurant
Not Permitted	Advent Finance	Main Street	Office
Not Permitted	J & S Products	Main Street	Office
Not Permitted	Key Real Estate	Main Street	Office
Not Permitted	Billiards café	Main Street	Restaurant
Not Permitted	Ayer Optical Shop	Main Street	Optical Shop
Not Permitted	Organic Dry Cleaners	Main Street	Dry Cleaners
Not Permitted	KD Nails	Main Street	Nail Salon
Not Permitted	Century Carpets	Main Street	Carpets
Not Permitted	Heads Up Hair Salon	Main Street	Hair Salon
Not Permitted	The Gift Shop	Main Street	Card Shop
Not Permitted	Porter Hair Salon	Main Street	Salon
Not Permitted	John's Barber	Main Street	Barber
Not Permitted	Rising Stars Martial Arts	Main Street	Hair Salon
Not Permitted	Carlins Tavern	Main Street	Restaurant
Not Permitted	Ayer Package Store	Main Street	Liquor Store
Not Permitted	Medicine Shoppe	Main Street	Pharmacy
Not Permitted	Mobil – Gary Acher	Main Street	Gas station
Not Permitted	Fire station	Main Street	Town
Not Permitted	Advocates	Main Street	Business
Not Permitted	Moore's Lumber	Main Street	Lumber/Hardware
Not Permitted	Lei's Nails	Main Street	Nail Salon
Not Permitted	Capril Bakery	Main Street	Bakery

Permitted	Industry	Address	Process
Not Permitted	Junction RPD	Main Street	Business
Not Permitted	Debbie's Staffing	Main Street	Business
Not Permitted	Kitchen and Baths	Main Street	Shop
Not Permitted	Organic Nails	Main Street	Nail Salon
Not Permitted	42 Gardner Building	Main Street	Office
Not Permitted	Parthenon Pizza	60 W. Main Street	Restaurant
Not Permitted	Tipo's Tacos	Main Street	Printer
Not Permitted	Ardent Mills	Nemco Way	Grain Manufacturer
Not Permitted	Ceric Fabrication	Nemco Way	Business
Not Permitted	LD Russo, Inc.	Nemco Way	Business
Not Permitted	M Delvecchio Construction	Nemco Way	Contractor
Not Permitted	Rd Kaniard Homes, Inc.	Nemco Way	Business
Not Permitted	JMO Distribution	Nemco Way	Warehouse
Not Permitted	Optometrics	Nemco Way	Manufactures Lenses
Not Permitted	Skyline Coating	Nemco Way	Business
Not Permitted	Ayer Oil Co.	Nemco Way	Business
Not Permitted	Stoneybrook Contractor Storage	Nemco Way	Storage
Not Permitted	Continental Carbonic	Nemco Way	Manufactures Dry Ice
Not Permitted	McGuane Plumbing/Heating	New England Way	Plumbing
Permitted	Nasoya Foods	New England Way	Tofu Manufacturer
Not Permitted	Silpro Masonry Systems	2 New England Way	Manufactures Cement Leveler
Not Permitted	Checkered Flag Auto Valve	Park Street	Auto Part Sales
Not Permitted	Friots Water Treatment	Park Street	Water Sales
Not Permitted	HPI	Park Street	Shop
Not Permitted	My mechanic	Park Street	Mechanic
Not Permitted	Still River Basin	100 Park Street	Brewery
Not Permitted	N. E. muffler	Park Street	Mechanic
Not Permitted	Park St. Garage	Park Street	Garage
Not Permitted	Prof. hair Design	Park Street	Hair Salon

Permitted	Industry	Address	Process
Not Permitted	Ayer Convenience	Park Street	Variety Store
Not Permitted	Ayer Credit Union	Park Street	Bank
Not Permitted	Ayer Police	Park Street	Police Dept.
Not Permitted	The Vineyard Wine	Park Street	Wine Shop
Not Permitted	Beads Pools/Spa	Park Street	Realtor
Not Permitted	Aubuchon Hardware	Park Street	Hardware Store
Not Permitted	Jiffy Lube	Park Street	Lube Shop
Not Permitted	Gulf	Park Street	Gas Station
Not Permitted	Verona Pizza and Subs	18 Park St	Restaurant
Not Permitted	Ayer Best Cleaners	44 Park Street	Laundromat/Commercial
Not Permitted	Bubble-It Laundromat	95 Park Street	Laundromat
Not Permitted	Dunkin Donuts	Park Street	Restaurant
Not Permitted	Napa Auto Parts	Park Street	Auto Sales
Not Permitted	Shop n Save	Park Street	Small Brewery
Not Permitted	National Grid	Radisson Road	Power Company
Not Permitted	Tiny's Restaurant	Route 2A	Restaurant
Not Permitted	Pauline's Variety	Route 2A	Variety Store
Not Permitted	Shaker Hills	Route 2A	Golf Course
Not Permitted	JC Madigan	Route 2A	Trucking Business
Not Permitted	New Auto	Route 2A	Gas Station
Not Permitted	Toreko Rental	Route 2A	Camper Sales
Not Permitted	Banka Staffing	Route 2A	Business
Not Permitted	Gage	Route 2A	Cannabis Shop
Not Permitted	Lazy Mary's	Route 2A	Restaurant
Not Permitted	Gervais Ford	Route 2A	Car sales, some repair
Not Permitted	Liquors	Route 2A	Liquor store
Not Permitted	Jack O Lantern	Route 2A	Restaurant
Not Permitted	Real Estate	Route 2A	Realtor
Not Permitted	Tidal Wave Car Wash	Route 2A	Car wash

Permitted	Industry	Address	Process
Not Permitted	Manford Mechanical	Route 2A	Auto Body
Not Permitted	Woo Jung	Route 2A	Restaurant
Not Permitted	Ayer Beauty Garden	Route 2A	Hair Salon
Not Permitted	Yami Yami	Route 2A	Restaurant
Not Permitted	St. Mary's Church	Route 2A	Church
Not Permitted	Ayer Animal Medical Center	Route 2A	Animal Medical Center
Not Permitted	Oriental Market	Route 2A	Restaurant
Not Permitted	Family Dollar	Route 2A	Grocery
Not Permitted	Union Coffee	Sandy Pond Road	Restaurant
Not Permitted	Page School	Washington Street	School
Not Permitted	Lawn Doctor	Westford Road	Lawn Services
Not Permitted	Catania Spana	Westford Road	Manufactures Olive Oil
Not Permitted	Sealed Air	Westford Road	Commercial
Not Permitted	Ratta	Westford Road	Septic Service
Not Permitted	W Leahy Co. Trucking	Westford Road	Trucking Company
Not Permitted	Routhier	Westford Road	Trucking Company
Not Permitted	Dr. Poulin	Westford Road	Steel warehouse
Not Permitted	Baker Joy	Willow Hill Road	Warehouse
Not Permitted	K & W Tires	Willow Hill Road	Tire Warehouse
Not Permitted	Creative Materials	Willow Hill Road	Manufacturer
Not Permitted	Associated Environmental Systems	Willow Hill Road	Laboratory
Not Permitted	BMA	Willow Hill Road	Warehouse
Permitted	Boxmill Farms	Willow Hill Road	Apple Cider Manufacturer
Not Permitted	NMEC	Willow Hill Road	Business
Not Permitted	U Haul	Willow Road	U Haul
Not Permitted	L3 Ancom	Willow Road	Business
Not Permitted	GM Piping	11 Willow Road	High purity piping manufacturer

APPENDIX C

COMPLIANCE MONITORING



ANALYTICAL REPORT

Lab Number:	L2042072
Client:	Hoyle, Tanner & Associates, Inc. 150 Dow Street Manchester, NH 03101
ATTN:	Paula Boyle
Phone:	(603) 669-5555
Project Name:	CPF, INC.- IPP SAMPLING
Project Number:	Not Specified
Report Date:	10/09/20

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: CPF, INC.- IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042072
Report Date: 10/09/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2042072-01	CPF COMPOSITE	WATER	25 COPELAND DRIVE, AYER, MA	10/02/20 09:15	10/02/20

Project Name: CPF, INC.- IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042072
Report Date: 10/09/20

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

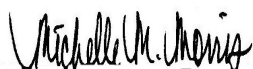
Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Michelle M. Morris

Title: Technical Director/Representative

Date: 10/09/20

INORGANICS & MISCELLANEOUS

Project Name: CPF, INC.- IPP SAMPLING**Lab Number:** L2042072**Project Number:** Not Specified**Report Date:** 10/09/20**SAMPLE RESULTS****Lab ID:** L2042072-01**Date Collected:** 10/02/20 09:15**Client ID:** CPF COMPOSITE**Date Received:** 10/02/20**Sample Location:** 25 COPELAND DRIVE, AYER, MA**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	15.		mg/l	10	NA	2	-	10/08/20 14:10	121,2540D	AC
Phosphorus, Total	5.12		mg/l	0.125	--	12.5	10/09/20 06:00	10/09/20 10:02	121,4500P-E	MV
BOD, 5 day	370		mg/l	60	NA	30	10/03/20 08:35	10/08/20 03:40	121,5210B	CW



Project Name: CPF, INC.- IPP SAMPLING

Lab Number: L2042072

Project Number: Not Specified

Report Date: 10/09/20

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1417633-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	10/03/20 08:35	10/08/20 03:40	121,5210B	CW
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1419714-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	10/08/20 14:10	121,2540D	AC
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1420072-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	10/09/20 06:00	10/09/20 09:16	121,4500P-E	MV

Lab Control Sample Analysis

Batch Quality Control

Project Name: CPF, INC.- IPP SAMPLING

Project Number: Not Specified

Lab Number: L2042072

Report Date: 10/09/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1417633-2								
BOD, 5 day	90		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1419714-2								
Solids, Total Suspended	99		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1420072-2								
Phosphorus, Total	95		-		80-120	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: CPF, INC.- IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042072
Report Date: 10/09/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1417633-4 QC Sample: L2041137-11 Client ID: MS Sample												
BOD, 5 day	ND	100	71	71		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1420072-4 QC Sample: L2042842-02 Client ID: MS Sample												
Phosphorus, Total	0.066	0.5	0.572	101		-	-		75-125	-		20

Project Name: CPF, INC.- IPP SAMPLING
Project Number: Not Specified

Lab Duplicate Analysis

Batch Quality Control

Lab Number: L2042072
Report Date: 10/09/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1417633-3 QC Sample: L2041137-11 Client ID: DUP Sample						
BOD, 5 day	ND	ND	mg/l	NC		35
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1419714-3 QC Sample: L2041625-01 Client ID: DUP Sample						
Solids, Total Suspended	380	400	mg/l	5		29
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1420072-3 QC Sample: L2042842-02 Client ID: DUP Sample						
Phosphorus, Total	0.066	0.064	mg/l	3		20

Project Name: CPF, INC.- IPP SAMPLING**Lab Number:** L2042072**Project Number:** Not Specified**Report Date:** 10/09/20**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information**Cooler** **Custody Seal**

A Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2042072-01A	Plastic 500ml H2SO4 preserved	A	<2	<2	2.2	Y	Absent		TPHOS-4500(28)
L2042072-01B	Plastic 500ml unpreserved	A	6	6	2.2	Y	Absent		BOD-5210(2)
L2042072-01C	Plastic 950ml unpreserved	A	6	6	2.2	Y	Absent		TSS-2540(7)

Project Name: CPF, INC.- IPP SAMPLING**Lab Number:** L2042072**Project Number:** Not Specified**Report Date:** 10/09/20

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name: CPF, INC.- IPP SAMPLING**Lab Number:** L2042072**Project Number:** Not Specified**Report Date:** 10/09/20**Footnotes**

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.

Report Format: Data Usability Report



Project Name: CPF, INC.- IPP SAMPLING**Lab Number:** L2042072**Project Number:** Not Specified**Report Date:** 10/09/20**Data Qualifiers**

- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: CPF, INC.- IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042072
Report Date: 10/09/20

REFERENCES

- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 17

Published Date: 4/28/2020 9:42:21 AM

Page 1 of 1

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene**EPA 8260C:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.**EPA 8270D:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.**SM4500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.**Mansfield Facility****SM 2540D:** TSS**EPA 8082A:** NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.**EPA TO-12** Non-methane organics**EPA 3C** Fixed gases**Biological Tissue Matrix:** EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:**Drinking Water****EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,****EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B****EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.**Microbiology: SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.****Non-Potable Water****SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.**EPA 624.1:** Volatile Halocarbons & Aromatics,**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.**Microbiology: SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.****Mansfield Facility:****Drinking Water****EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.**EPA 522.****Non-Potable Water****EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.**EPA 245.1** Hg.**SM2340B**

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



EST Associates, Inc.
124 Crescent Road
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Laboratory:

Alpha Analytical Labs
(508) 898-9220

2042072

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteri

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Lab Invoice To: EST

Hoyle Tanner

Lab Report To:

EST Invoice To: Hoyle Tanner

5555-Q#

Q#01409 PO#27573

Site: CPF, Inc.

Address: 25 Copeland Drive

Ayer MA 01432-1751

Contact: Peter Ness

Phone #: (978) 772-9287

Description: *Town of Ayer IPP Sampling*

Client: Hoyle, Tanner & Associates, Inc.

Address: 150 Dow Street

Manchester NH 03101-

Contact: Paula Boyle

Phone #: (603) 669-5555

Fax #: (603) 669-4168

☐ Rush _____ Day Turnaround

LOCATION (Sample Identification)	Sample Type	Container			Sampling		Preservative *	Laboratory Analysis	Notes
		Size	Type	#	Date	Time			
CPF Composite (Flow)	1	500 ml	P	1	10/1-2	0915-0915	H2SO4	Total Phosphorus	pH = 7.20
CPF Composite	1	500 ml	P	1	↓	↓	None	BOD	Flow = 165000
CPF Composite	1	1 L	P	1	↓	↓	None	TSS	Temp = 19.5
</									



ANALYTICAL REPORT

Lab Number:	L2042077
Client:	Hoyle, Tanner & Associates, Inc. 150 Dow Street Manchester, NH 03101
ATTN:	Paula Boyle
Phone:	(603) 669-5555
Project Name:	EPIC ENTERPRISES-IPP SAMPLING
Project Number:	Not Specified
Report Date:	10/11/20

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: EPIC ENTERPRISES-IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042077
Report Date: 10/11/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2042077-01	EPIC COMPOSITE	WATER	11 COPELAND DRIVE, AYER, MA	10/02/20 09:00	10/02/20

Project Name: EPIC ENTERPRISES-IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042077
Report Date: 10/11/20

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

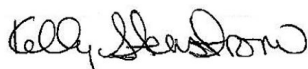
Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Kelly Stenstrom

Title: Technical Director/Representative

Date: 10/11/20

INORGANICS & MISCELLANEOUS

Project Name: EPIC ENTERPRISES-IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042077
Report Date: 10/11/20

SAMPLE RESULTS

Lab ID: L2042077-01
Client ID: EPIC COMPOSITE
Sample Location: 11 COPELAND DRIVE, AYER, MA

Date Collected: 10/02/20 09:00
Date Received: 10/02/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	150		mg/l	34	NA	6.7	-	10/08/20 14:10	121,2540D	AC
Phosphorus, Total	17.5		mg/l	0.250	--	25	10/06/20 08:00	10/07/20 08:45	121,4500P-E	MV
BOD, 5 day	270		mg/l	150	NA	75	10/03/20 08:35	10/08/20 03:40	121,5210B	CW



Project Name: EPIC ENTERPRISES-IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042077
Report Date: 10/11/20

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1417633-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	10/03/20 08:35	10/08/20 03:40	121,5210B	CW
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1418496-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	10/06/20 08:00	10/07/20 09:50	121,4500P-E	MV
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1419726-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	10/08/20 14:10	121,2540D	AC

Lab Control Sample Analysis**Batch Quality Control****Project Name:** EPIC ENTERPRISES-IPP SAMPLING**Lab Number:** L2042077**Project Number:** Not Specified**Report Date:** 10/11/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1417633-2								
BOD, 5 day	90		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1418496-2								
Phosphorus, Total	104		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1419726-2								
Solids, Total Suspended	99		-		80-120	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: EPIC ENTERPRISES-IPP SAMPLING

Lab Number: L2042077

Project Number: Not Specified

Report Date: 10/11/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1417633-4 QC Sample: L2041137-11 Client ID: MS Sample												
BOD, 5 day	ND	100	71	71		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1418496-4 QC Sample: L2042185-01 Client ID: MS Sample												
Phosphorus, Total	0.093	0.5	0.615	104		-	-		75-125	-		20

Project Name: EPIC ENTERPRISES-IPP SAMPLING
Project Number: Not Specified

Lab Duplicate Analysis

Batch Quality Control

Lab Number: L2042077
Report Date: 10/11/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1417633-3 QC Sample: L2041137-11 Client ID: DUP Sample						
BOD, 5 day	ND	ND	mg/l	NC		35
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1418496-3 QC Sample: L2042185-01 Client ID: DUP Sample						
Phosphorus, Total	0.093	0.090	mg/l	3		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1419726-3 QC Sample: L2042090-01 Client ID: DUP Sample						
Solids, Total Suspended	700	670	mg/l	4		29

Project Name: EPIC ENTERPRISES-IPP SAMPLING**Lab Number:** L2042077**Project Number:** Not Specified**Report Date:** 10/11/20**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information**Cooler** **Custody Seal**

A Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2042077-01A	Plastic 500ml H2SO4 preserved	A	<2	<2	2.2	Y	Absent		TPHOS-4500(28)
L2042077-01B	Plastic 500ml unpreserved	A	7	7	2.2	Y	Absent		BOD-5210(2)
L2042077-01C	Plastic 950ml unpreserved	A	7	7	2.2	Y	Absent		TSS-2540(7)

Project Name: EPIC ENTERPRISES-IPP SAMPLING**Lab Number:** L2042077**Project Number:** Not Specified**Report Date:** 10/11/20

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name: EPIC ENTERPRISES-IPP SAMPLING**Lab Number:** L2042077**Project Number:** Not Specified**Report Date:** 10/11/20**Footnotes**

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.

Report Format: Data Usability Report



Project Name: EPIC ENTERPRISES-IPP SAMPLING**Lab Number:** L2042077**Project Number:** Not Specified**Report Date:** 10/11/20**Data Qualifiers**

- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: EPIC ENTERPRISES-IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042077
Report Date: 10/11/20

REFERENCES

- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Alpha Analytical, Inc.

ID No.:17873

Facility: **Company-wide**

Revision 17

Department: **Quality Assurance**

Published Date: 4/28/2020 9:42:21 AM

Title: **Certificate/Approval Program Summary**

Page 1 of 1

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene**EPA 8260C:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.**EPA 8270D:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.**SM4500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.**Mansfield Facility****SM 2540D:** TSS**EPA 8082A:** NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.**EPA TO-12** Non-methane organics**EPA 3C** Fixed gases**Biological Tissue Matrix:** EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:**Drinking Water****EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,****EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B****EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.**Microbiology:** **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.****Non-Potable Water****SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.**EPA 624.1:** Volatile Halocarbons & Aromatics,**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.****Mansfield Facility:****Drinking Water****EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.**EPA 522.****Non-Potable Water****EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.**EPA 245.1** Hg.**SM2340B**

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



EST Associates, Inc.
124 Crescent Road
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteri

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Laboratory:

L2Y207

Alpha Analytical Labs
(508) 898-9220

Lab Invoice To: EST

Hoyle Tanner

Lab Report To:

EST Invoice To: Hoyle Tanner

5555-Q#

Q#01409 PO#27573

Site: Epic Enterprises, Inc.

Address: 11 Copeland Drive

Ayer MA 01432-1767

Contact: Tim Duprey

Phone #: (978) 772-2340

Description: *Town of Ayer IPP Sampling*

Client: Hoyle, Tanner & Associates, Inc.

Address: 150 Dow Street

Manchester NH 03101-

Contact: Paula Boyle

Phone #: (603) 669-5555

Fax #: (603) 669-4168

☐ Rush ____Day Turnaround[illegible]



ANALYTICAL REPORT

Lab Number:	L2041880
Client:	EST Associates, Inc. 124 Crescent Road Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	NASOYA FOODS, INC
Project Number:	NASOYA FOODS, INC.
Report Date:	10/09/20

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: NASOYA FOODS, INC
Project Number: NASOYA FOODS, INC.

Lab Number: L2041880
Report Date: 10/09/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2041880-01	EFFLUENT COMPOSITE	WATER	1 NEW ENGLAND WAY, AYER, MA	10/02/20 08:15	10/02/20

Project Name: NASOYA FOODS, INC
Project Number: NASOYA FOODS, INC.

Lab Number: L2041880
Report Date: 10/09/20

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: NASOYA FOODS, INC
Project Number: NASOYA FOODS, INC.

Lab Number: L2041880
Report Date: 10/09/20

Case Narrative (continued)

Sample Receipt

L2041880-01: The sample identified as "EFFLUENT COMPOSITE" on the chain of custody was identified as "Epic composite" on the container label. At the client's request, the sample is reported as "EFFLUENT COMPOSITE".

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 10/09/20

INORGANICS & MISCELLANEOUS

Project Name: NASOYA FOODS, INC
Project Number: NASOYA FOODS, INC.

Lab Number: L2041880
Report Date: 10/09/20

SAMPLE RESULTS

Lab ID: L2041880-01
Client ID: EFFLUENT COMPOSITE
Sample Location: 1 NEW ENGLAND WAY, AYER, MA

Date Collected: 10/02/20 08:15
Date Received: 10/02/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	32.		mg/l	10	NA	2	-	10/08/20 14:10	121,2540D	AC
Phosphorus, Total	0.452		mg/l	0.020	--	2	10/04/20 10:00	10/06/20 06:20	121,4500P-E	MV
BOD, 5 day	340		mg/l	60	NA	30	10/03/20 05:30	10/08/20 02:05	121,5210B	CW



Project Name: NASOYA FOODS, INC
Project Number: NASOYA FOODS, INC.

Lab Number: L2041880
Report Date: 10/09/20

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1417586-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	10/03/20 05:30	10/08/20 02:05	121,5210B	CW
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1418015-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	10/04/20 10:00	10/06/20 06:18	121,4500P-E	MV
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1419714-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	10/08/20 14:10	121,2540D	AC

Lab Control Sample Analysis

Batch Quality Control

Project Name: NASOYA FOODS, INC
Project Number: NASOYA FOODS, INC.

Lab Number: L2041880
Report Date: 10/09/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1417586-2								
BOD, 5 day	90		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1418015-2								
Phosphorus, Total	97		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1419714-2								
Solids, Total Suspended	99		-		80-120	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: NASOYA FOODS, INC
Project Number: NASOYA FOODS, INC.

Lab Number: L2041880
Report Date: 10/09/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1417586-4 QC Sample: L2042069-01 Client ID: MS Sample												
BOD, 5 day	ND	100	91	91		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1418015-4 QC Sample: L2042101-01 Client ID: MS Sample												
Phosphorus, Total	0.060	0.5	0.562	100		-	-		75-125	-		20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: NASOYA FOODS, INC
Project Number: NASOYA FOODS, INC.

Lab Number: L2041880
Report Date: 10/09/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1417586-3 QC Sample: L2042069-01 Client ID: DUP Sample						
BOD, 5 day	ND	ND	mg/l	NC		35
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1418015-3 QC Sample: L2042101-01 Client ID: DUP Sample						
Phosphorus, Total	0.060	0.058	mg/l	3		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1419714-3 QC Sample: L2041625-01 Client ID: DUP Sample						
Solids, Total Suspended	380	400	mg/l	5		29

Project Name: NASOYA FOODS, INC**Lab Number:** L2041880**Project Number:** NASOYA FOODS, INC.**Report Date:** 10/09/20**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information**Cooler** **Custody Seal**

A Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2041880-01A	Plastic 500ml H2SO4 preserved	A	<2	<2	5.9	Y	Absent		TPHOS-4500(28)
L2041880-01B	Plastic 500ml unpreserved	A	7	7	5.9	Y	Absent		BOD-5210(2)
L2041880-01C	Plastic 950ml unpreserved	A	7	7	5.9	Y	Absent		TSS-2540(7)

Project Name: NASOYA FOODS, INC
Project Number: NASOYA FOODS, INC.

Lab Number: L2041880
Report Date: 10/09/20

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
	Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



Project Name: NASOYA FOODS, INC
Project Number: NASOYA FOODS, INC.

Lab Number: L2041880
Report Date: 10/09/20

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.

Report Format: Data Usability Report



Project Name: NASOYA FOODS, INC
Project Number: NASOYA FOODS, INC.

Lab Number: L2041880
Report Date: 10/09/20

Data Qualifiers

- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: NASOYA FOODS, INC
Project Number: NASOYA FOODS, INC.

Lab Number: L2041880
Report Date: 10/09/20

REFERENCES

- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Alpha Analytical, Inc.ID No.: **17873**Facility: **Company-wide**

Revision 17

Department: **Quality Assurance**

Published Date: 4/28/2020 9:42:21 AM

Title: **Certificate/Approval Program Summary**

Page 1 of 1

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene**EPA 8260C:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.**EPA 8270D:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.**SM4500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.**Mansfield Facility****SM 2540D:** TSS**EPA 8082A:** NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.**EPA TO-12** Non-methane organics**EPA 3C** Fixed gases**Biological Tissue Matrix:** EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:**Drinking Water****EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B****EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.**Microbiology:** **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.****Non-Potable Water****SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.**EPA 624.1:** Volatile Halocarbons & Aromatics,**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.****Mansfield Facility:****Drinking Water****EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg. **EPA 522.****Non-Potable Water****EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.**EPA 245.1** Hg.**SM2340B**

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



EST Associates, Inc.
124 Crescent Road
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Laboratory:

Alpha Analytical Labs
(508) 898-9220

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteri

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Lab Invoice To: EST

Hoyle Tanner

Lab Report To:

EST Invoice To: Hoyle Tanner

5555-Q#-xx

Q#01409 PO#27573

L241880

Site: Nasoya Foods, Inc.

Client: Hoyle, Tanner & Associates, Inc.

Address: 1 New England Way

Address: 150 Dow Street

Ayer MA 01432-

Manchester NH 03101-

Contact: Peter Breed

Contact: Paula Boyle

Phone #: (978) 772-6880

Phone #: (603) 669-5555

☐ Rush ____ Day Turnaround

Description: *Town of Ayer IPP Sampling*

Fax #: (603) 669-4168

LOCATION (Sample Identification)	Sample Type	Container			Sampling		Preservative *	Laboratory Analysis		Notes		
		Size	Type	#	Date	Time						
Effluent Composite (Flow)	1	1 L	P	1	10/1-2	0840-0915	None	TSS		pH = 7.70		
Effluent Composite	1	500 ml	P	1	↓	↓	None	BOD5		Flow = 150429		
Effluent Composite	1	500 ml	P	1	↓	↓	H2SO4	Total Phosphorus		Temp = 25.2		
Sampler's Name (Print) Signature						DATE	TIME	NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
Matt Groul Matt Groul						10/2/20	0815	1	Matt Groul	DRL	10/2/20	09:10
Additional Comments:								2				
*Please use lowest possible detection limit for each parameter.								3				
								4				
								5				
*All samples chilled to 4 degrees celsius.												

APPENDIX D

WWTF ANALYTICAL REPORTS



ANALYTICAL REPORT

Lab Number:	L2042150
Client:	EST Associates, Inc. 124 Crescent Road Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	BROOK STREET WWTF IPP SAMPLING
Project Number:	Not Specified
Report Date:	10/12/20

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2042150-01	INFLUENT COMPOSITE	WATER	BROOK STREET, AYER, MA	10/02/20 07:45	10/02/20
L2042150-02	INFLUENT GRAB	WATER	BROOK STREET, AYER, MA	10/02/20 07:45	10/02/20
L2042150-03	EFFLUENT COMPOSITE	WATER	BROOK STREET, AYER, MA	10/02/20 14:45	10/02/20
L2042150-04	EFFLUENT GRAB	WATER	BROOK STREET, AYER, MA	10/02/20 14:45	10/02/20

Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

Case Narrative (continued)

Sample Receipt

L2042150-03: The sample was received above the appropriate pH for the Total Hg, Total Metals analysis. The laboratory added additional HNO₃ to a pH <2.

Volatile Organics by Method 624

L2042150-02 and -04 was analyzed on a dilution. The MWRA detection limits were achieved.

The WG1418148-9 LCS recovery, associated with L2042150-02, is above the acceptance criteria for acrolein (150%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.


The WG1417940-5/-6 MS/MSD recoveries, performed on L2042150-04, are outside the acceptance criteria for vinyl acetate (55%/55%); however, the associated LCS recoveries are within overall method allowances. No further action was required.

Semivolatile Organics by Method 625

L2042150-01: The surrogate recovery is above the acceptance criteria for nitrobenzene-d₅ (144%). Since the sample was non-detect for all the base-neutral analytes, re-analysis was not required.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Lisa Westerlind

Title: Technical Director/Representative

Date: 10/12/20

ORGANICS

VOLATILES

Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

SAMPLE RESULTS

Lab ID: L2042150-02 D
Client ID: INFLUENT GRAB
Sample Location: BROOK STREET, AYER, MA

Date Collected: 10/02/20 07:45
Date Received: 10/02/20
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 128,624.1
Analytical Date: 10/03/20 11:23
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	10	--	10
1,1-Dichloroethane	ND		ug/l	15	--	10
Chloroform	13		ug/l	10	--	10
Carbon tetrachloride	ND		ug/l	10	--	10
1,2-Dichloropropane	ND		ug/l	35	--	10
Dibromochloromethane	ND		ug/l	10	--	10
1,1,2-Trichloroethane	ND		ug/l	15	--	10
2-Chloroethylvinyl ether	ND		ug/l	100	--	10
Tetrachloroethene	ND		ug/l	10	--	10
Chlorobenzene	ND		ug/l	35	--	10
Trichlorofluoromethane	ND		ug/l	50	--	10
1,2-Dichloroethane	ND		ug/l	15	--	10
1,1,1-Trichloroethane	ND		ug/l	20	--	10
Bromodichloromethane	ND		ug/l	10	--	10
trans-1,3-Dichloropropene	ND		ug/l	15	--	10
cis-1,3-Dichloropropene	ND		ug/l	15	--	10
1,3-Dichloropropene, Total	ND		ug/l	15	--	10
Bromoform	ND		ug/l	10	--	10
1,1,2,2-Tetrachloroethane	ND		ug/l	10	--	10
Benzene	ND		ug/l	10	--	10
Toluene	ND		ug/l	10	--	10
Ethylbenzene	ND		ug/l	10	--	10
Chloromethane	ND		ug/l	50	--	10
Bromomethane	ND		ug/l	50	--	10
Vinyl chloride	ND		ug/l	10	--	10
Chloroethane	ND		ug/l	20	--	10
1,1-Dichloroethene	ND		ug/l	10	--	10
trans-1,2-Dichloroethene	ND		ug/l	15	--	10

Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

SAMPLE RESULTS

Lab ID: L2042150-02 D
Client ID: INFLUENT GRAB
Sample Location: BROOK STREET, AYER, MA

Date Collected: 10/02/20 07:45
Date Received: 10/02/20
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
cis-1,2-Dichloroethene	ND		ug/l	10	--	10
Trichloroethene	ND		ug/l	10	--	10
1,2-Dichlorobenzene	ND		ug/l	50	--	10
1,3-Dichlorobenzene	ND		ug/l	50	--	10
1,4-Dichlorobenzene	ND		ug/l	50	--	10
p/m-Xylene	ND		ug/l	20	--	10
o-xylene	ND		ug/l	10	--	10
Xylenes, Total	ND		ug/l	10	--	10
Styrene	ND		ug/l	10	--	10
Acetone	ND		ug/l	100	--	10
Carbon disulfide	ND		ug/l	50	--	10
2-Butanone	ND		ug/l	100	--	10
Vinyl acetate	ND		ug/l	100	--	10
4-Methyl-2-pentanone	ND		ug/l	100	--	10
2-Hexanone	ND		ug/l	100	--	10
Acrolein	ND		ug/l	80	--	10
Acrylonitrile	ND		ug/l	100	--	10
Dibromomethane	ND		ug/l	10	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	95		60-140
Fluorobenzene	108		60-140
4-Bromofluorobenzene	96		60-140

Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

SAMPLE RESULTS

Lab ID: L2042150-04 D
Client ID: EFFLUENT GRAB
Sample Location: BROOK STREET, AYER, MA

Date Collected: 10/02/20 14:45
Date Received: 10/02/20
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 128,624.1
Analytical Date: 10/04/20 16:21
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	10	--	10
1,1-Dichloroethane	ND		ug/l	15	--	10
Chloroform	ND		ug/l	10	--	10
Carbon tetrachloride	ND		ug/l	10	--	10
1,2-Dichloropropane	ND		ug/l	35	--	10
Dibromochloromethane	ND		ug/l	10	--	10
1,1,2-Trichloroethane	ND		ug/l	15	--	10
2-Chloroethylvinyl ether	ND		ug/l	100	--	10
Tetrachloroethene	ND		ug/l	10	--	10
Chlorobenzene	ND		ug/l	35	--	10
Trichlorofluoromethane	ND		ug/l	50	--	10
1,2-Dichloroethane	ND		ug/l	15	--	10
1,1,1-Trichloroethane	ND		ug/l	20	--	10
Bromodichloromethane	ND		ug/l	10	--	10
trans-1,3-Dichloropropene	ND		ug/l	15	--	10
cis-1,3-Dichloropropene	ND		ug/l	15	--	10
1,3-Dichloropropene, Total	ND		ug/l	15	--	10
Bromoform	ND		ug/l	10	--	10
1,1,2,2-Tetrachloroethane	ND		ug/l	10	--	10
Benzene	ND		ug/l	10	--	10
Toluene	ND		ug/l	10	--	10
Ethylbenzene	ND		ug/l	10	--	10
Chloromethane	ND		ug/l	50	--	10
Bromomethane	ND		ug/l	50	--	10
Vinyl chloride	ND		ug/l	10	--	10
Chloroethane	ND		ug/l	20	--	10
1,1-Dichloroethene	ND		ug/l	10	--	10
trans-1,2-Dichloroethene	ND		ug/l	15	--	10

Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

SAMPLE RESULTS

Lab ID: L2042150-04 D
Client ID: EFFLUENT GRAB
Sample Location: BROOK STREET, AYER, MA

Date Collected: 10/02/20 14:45
Date Received: 10/02/20
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
cis-1,2-Dichloroethene	ND		ug/l	10	--	10
Trichloroethene	ND		ug/l	10	--	10
1,2-Dichlorobenzene	ND		ug/l	50	--	10
1,3-Dichlorobenzene	ND		ug/l	50	--	10
1,4-Dichlorobenzene	ND		ug/l	50	--	10
p/m-Xylene	ND		ug/l	20	--	10
o-xylene	ND		ug/l	10	--	10
Xylenes, Total	ND		ug/l	10	--	10
Styrene	ND		ug/l	10	--	10
Acetone	ND		ug/l	100	--	10
Carbon disulfide	ND		ug/l	50	--	10
2-Butanone	ND		ug/l	100	--	10
Vinyl acetate	ND		ug/l	100	--	10
4-Methyl-2-pentanone	ND		ug/l	100	--	10
2-Hexanone	ND		ug/l	100	--	10
Acrolein	ND		ug/l	80	--	10
Acrylonitrile	ND		ug/l	100	--	10
Dibromomethane	ND		ug/l	10	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	93		60-140
Fluorobenzene	110		60-140
4-Bromofluorobenzene	97		60-140

Project Name: BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 10/04/20 12:04
 Analyst: KJD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 04 Batch: WG1417940-4					
Methylene chloride	ND		ug/l	1.0	--
1,1-Dichloroethane	ND		ug/l	1.5	--
Chloroform	ND		ug/l	1.0	--
Carbon tetrachloride	ND		ug/l	1.0	--
1,2-Dichloropropane	ND		ug/l	3.5	--
Dibromochloromethane	ND		ug/l	1.0	--
1,1,2-Trichloroethane	ND		ug/l	1.5	--
2-Chloroethylvinyl ether	ND		ug/l	10	--
Tetrachloroethene	ND		ug/l	1.0	--
Chlorobenzene	ND		ug/l	3.5	--
Trichlorofluoromethane	ND		ug/l	5.0	--
1,2-Dichloroethane	ND		ug/l	1.5	--
1,1,1-Trichloroethane	ND		ug/l	2.0	--
Bromodichloromethane	ND		ug/l	1.0	--
trans-1,3-Dichloropropene	ND		ug/l	1.5	--
cis-1,3-Dichloropropene	ND		ug/l	1.5	--
1,3-Dichloropropene, Total	ND		ug/l	1.5	--
Bromoform	ND		ug/l	1.0	--
1,1,2,2-Tetrachloroethane	ND		ug/l	1.0	--
Benzene	ND		ug/l	1.0	--
Toluene	ND		ug/l	1.0	--
Ethylbenzene	ND		ug/l	1.0	--
Chloromethane	ND		ug/l	5.0	--
Bromomethane	ND		ug/l	5.0	--
Vinyl chloride	ND		ug/l	1.0	--
Chloroethane	ND		ug/l	2.0	--
1,1-Dichloroethene	ND		ug/l	1.0	--
trans-1,2-Dichloroethene	ND		ug/l	1.5	--
cis-1,2-Dichloroethene	ND		ug/l	1.0	--

Project Name: BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 10/04/20 12:04
 Analyst: KJD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 04 Batch: WG1417940-4					
Trichloroethene	ND		ug/l	1.0	--
1,2-Dichlorobenzene	ND		ug/l	5.0	--
1,3-Dichlorobenzene	ND		ug/l	5.0	--
1,4-Dichlorobenzene	ND		ug/l	5.0	--
p/m-Xylene	ND		ug/l	2.0	--
o-xylene	ND		ug/l	1.0	--
Xylenes, Total	ND		ug/l	1.0	--
Styrene	ND		ug/l	1.0	--
Acetone	ND		ug/l	10	--
Carbon disulfide	ND		ug/l	5.0	--
2-Butanone	ND		ug/l	10	--
Vinyl acetate	ND		ug/l	10	--
4-Methyl-2-pentanone	ND		ug/l	10	--
2-Hexanone	ND		ug/l	10	--
Acrolein	ND		ug/l	8.0	--
Acrylonitrile	ND		ug/l	10	--
Dibromomethane	ND		ug/l	1.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	96		60-140
Fluorobenzene	109		60-140
4-Bromofluorobenzene	96		60-140

Project Name: BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 10/03/20 05:15
 Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1418148-10					
Methylene chloride	ND		ug/l	1.0	--
1,1-Dichloroethane	ND		ug/l	1.5	--
Chloroform	ND		ug/l	1.0	--
Carbon tetrachloride	ND		ug/l	1.0	--
1,2-Dichloropropane	ND		ug/l	3.5	--
Dibromochloromethane	ND		ug/l	1.0	--
1,1,2-Trichloroethane	ND		ug/l	1.5	--
2-Chloroethylvinyl ether	ND		ug/l	10	--
Tetrachloroethene	ND		ug/l	1.0	--
Chlorobenzene	ND		ug/l	3.5	--
Trichlorofluoromethane	ND		ug/l	5.0	--
1,2-Dichloroethane	ND		ug/l	1.5	--
1,1,1-Trichloroethane	ND		ug/l	2.0	--
Bromodichloromethane	ND		ug/l	1.0	--
trans-1,3-Dichloropropene	ND		ug/l	1.5	--
cis-1,3-Dichloropropene	ND		ug/l	1.5	--
1,3-Dichloropropene, Total	ND		ug/l	1.5	--
Bromoform	ND		ug/l	1.0	--
1,1,2,2-Tetrachloroethane	ND		ug/l	1.0	--
Benzene	ND		ug/l	1.0	--
Toluene	ND		ug/l	1.0	--
Ethylbenzene	ND		ug/l	1.0	--
Chloromethane	ND		ug/l	5.0	--
Bromomethane	ND		ug/l	5.0	--
Vinyl chloride	ND		ug/l	1.0	--
Chloroethane	ND		ug/l	2.0	--
1,1-Dichloroethene	ND		ug/l	1.0	--
trans-1,2-Dichloroethene	ND		ug/l	1.5	--
cis-1,2-Dichloroethene	ND		ug/l	1.0	--

Project Name: BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 10/03/20 05:15
 Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1418148-10					
Trichloroethene	ND		ug/l	1.0	--
1,2-Dichlorobenzene	ND		ug/l	5.0	--
1,3-Dichlorobenzene	ND		ug/l	5.0	--
1,4-Dichlorobenzene	ND		ug/l	5.0	--
p/m-Xylene	ND		ug/l	2.0	--
o-xylene	ND		ug/l	1.0	--
Xylenes, Total	ND		ug/l	1.0	--
Styrene	ND		ug/l	1.0	--
Acetone	ND		ug/l	10	--
Carbon disulfide	ND		ug/l	5.0	--
2-Butanone	ND		ug/l	10	--
Vinyl acetate	ND		ug/l	10	--
4-Methyl-2-pentanone	ND		ug/l	10	--
2-Hexanone	ND		ug/l	10	--
Acrolein	ND		ug/l	8.0	--
Acrylonitrile	ND		ug/l	10	--
Dibromomethane	ND		ug/l	1.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	96		60-140
Fluorobenzene	110		60-140
4-Bromofluorobenzene	98		60-140

Lab Control Sample Analysis **Batch Quality Control**

Project Name: BROOK STREET WWTF IPP SAMPLING

Lab Number: L2042150

Project Number: Not Specified

Report Date: 10/12/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 04 Batch: WG1417940-3								
Methylene chloride	100		-		60-140	-		28
1,1-Dichloroethane	100		-		50-150	-		49
Chloroform	95		-		70-135	-		54
Carbon tetrachloride	105		-		70-130	-		41
1,2-Dichloropropane	115		-		35-165	-		55
Dibromochloromethane	90		-		70-135	-		50
1,1,2-Trichloroethane	95		-		70-130	-		45
2-Chloroethylvinyl ether	100		-		1-225	-		71
Tetrachloroethene	90		-		70-130	-		39
Chlorobenzene	85		-		65-135	-		53
Trichlorofluoromethane	90		-		50-150	-		84
1,2-Dichloroethane	115		-		70-130	-		49
1,1,1-Trichloroethane	115		-		70-130	-		36
Bromodichloromethane	100		-		65-135	-		56
trans-1,3-Dichloropropene	95		-		50-150	-		86
cis-1,3-Dichloropropene	100		-		25-175	-		58
Bromoform	80		-		70-130	-		42
1,1,2,2-Tetrachloroethane	100		-		60-140	-		61
Benzene	115		-		65-135	-		61
Toluene	100		-		70-130	-		41
Ethylbenzene	95		-		60-140	-		63
Chloromethane	70		-		1-205	-		60
Bromomethane	42		-		15-185	-		61

Lab Control Sample Analysis **Batch Quality Control**

Project Name: BROOK STREET WWTF IPP SAMPLING

Lab Number: L2042150

Project Number: Not Specified

Report Date: 10/12/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 04 Batch: WG1417940-3								
Vinyl chloride	70		-		5-195	-		66
Chloroethane	95		-		40-160	-		78
1,1-Dichloroethene	95		-		50-150	-		32
trans-1,2-Dichloroethene	100		-		70-130	-		45
cis-1,2-Dichloroethene	90		-		60-140	-		30
Trichloroethene	105		-		65-135	-		48
1,2-Dichlorobenzene	95		-		65-135	-		57
1,3-Dichlorobenzene	90		-		70-130	-		43
1,4-Dichlorobenzene	90		-		65-135	-		57
p/m-Xylene	85		-		60-140	-		30
o-xylene	85		-		60-140	-		30
Styrene	80		-		60-140	-		30
Acetone	98		-		40-160	-		30
Carbon disulfide	90		-		60-140	-		30
2-Butanone	88		-		60-140	-		30
Vinyl acetate	102		-		60-140	-		30
4-Methyl-2-pentanone	98		-		60-140	-		30
2-Hexanone	104		-		60-140	-		30
Acrolein	140		-		60-140	-		30
Acrylonitrile	110		-		60-140	-		60
Dibromomethane	100		-		70-130	-		30

Lab Control Sample Analysis**Batch Quality Control****Project Name:** BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
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Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 04 Batch: WG1417940-3

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	96				60-140
Fluorobenzene	111				60-140
4-Bromofluorobenzene	94				60-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: BROOK STREET WWTF IPP SAMPLING

Lab Number: L2042150

Project Number: Not Specified

Report Date: 10/12/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1418148-9								
Methylene chloride	105		-		60-140	-		28
1,1-Dichloroethane	115		-		50-150	-		49
Chloroform	95		-		70-135	-		54
Carbon tetrachloride	110		-		70-130	-		41
1,2-Dichloropropane	110		-		35-165	-		55
Dibromochloromethane	90		-		70-135	-		50
1,1,2-Trichloroethane	95		-		70-130	-		45
2-Chloroethylvinyl ether	115		-		1-225	-		71
Tetrachloroethene	95		-		70-130	-		39
Chlorobenzene	90		-		65-135	-		53
Trichlorofluoromethane	105		-		50-150	-		84
1,2-Dichloroethane	115		-		70-130	-		49
1,1,1-Trichloroethane	115		-		70-130	-		36
Bromodichloromethane	95		-		65-135	-		56
trans-1,3-Dichloropropene	90		-		50-150	-		86
cis-1,3-Dichloropropene	100		-		25-175	-		58
Bromoform	85		-		70-130	-		42
1,1,2,2-Tetrachloroethane	100		-		60-140	-		61
Benzene	115		-		65-135	-		61
Toluene	105		-		70-130	-		41
Ethylbenzene	105		-		60-140	-		63
Chloromethane	105		-		1-205	-		60
Bromomethane	85		-		15-185	-		61

Lab Control Sample Analysis **Batch Quality Control**

Project Name: BROOK STREET WWTF IPP SAMPLING

Lab Number: L2042150

Project Number: Not Specified

Report Date: 10/12/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1418148-9								
Vinyl chloride	105		-		5-195	-		66
Chloroethane	115		-		40-160	-		78
1,1-Dichloroethene	110		-		50-150	-		32
trans-1,2-Dichloroethene	110		-		70-130	-		45
cis-1,2-Dichloroethene	90		-		60-140	-		30
Trichloroethene	110		-		65-135	-		48
1,2-Dichlorobenzene	95		-		65-135	-		57
1,3-Dichlorobenzene	90		-		70-130	-		43
1,4-Dichlorobenzene	90		-		65-135	-		57
p/m-Xylene	98		-		60-140	-		30
o-xylene	95		-		60-140	-		30
Styrene	90		-		60-140	-		30
Acetone	108		-		40-160	-		30
Carbon disulfide	105		-		60-140	-		30
2-Butanone	90		-		60-140	-		30
Vinyl acetate	122		-		60-140	-		30
4-Methyl-2-pentanone	108		-		60-140	-		30
2-Hexanone	110		-		60-140	-		30
Acrolein	150	Q	-		60-140	-		30
Acrylonitrile	118		-		60-140	-		60
Dibromomethane	110		-		70-130	-		30

Lab Control Sample Analysis**Batch Quality Control****Project Name:** BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1418148-9								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	98				60-140
Fluorobenzene	112				60-140
4-Bromofluorobenzene	96				60-140

Matrix Spike Analysis

Batch Quality Control

Project Name: BROOK STREET WWTF IPP SAMPLING

Project Number: Not Specified

Lab Number: L2042150

Report Date: 10/12/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 04 QC Batch ID: WG1417940-5 WG1417940-6 QC Sample: L2042150-04 Client ID: EFFLUENT GRAB												
Methylene chloride	ND	200	190	95		190	95		1-221	0		28
1,1-Dichloroethane	ND	200	170	85		170	85		59-155	0		49
Chloroform	ND	200	200	100		190	95		51-138	5		54
Carbon tetrachloride	ND	200	210	105		200	100		70-140	5		41
1,2-Dichloropropane	ND	200	230	115		230	115		1-210	0		55
Dibromochloromethane	ND	200	190	95		190	95		53-149	0		50
1,1,2-Trichloroethane	ND	200	190	95		190	95		52-150	0		45
2-Chloroethylvinyl ether	ND	200	200	100		200	100		1-305	0		71
Tetrachloroethene	ND	200	170	85		170	85		64-148	0		39
Chlorobenzene	ND	200	180	90		180	90		37-160	0		53
Trichlorofluoromethane	ND	200	170	85		160	80		17-181	6		84
1,2-Dichloroethane	ND	200	240	120		240	120		49-155	0		49
1,1,1-Trichloroethane	ND	200	220	110		220	110		52-162	0		36
Bromodichloromethane	ND	200	200	100		190	95		35-155	5		56
trans-1,3-Dichloropropene	ND	200	160	80		160	80		17-183	0		86
cis-1,3-Dichloropropene	ND	200	160	80		150	75		1-227	6		58
Bromoform	ND	200	170	85		170	85		45-169	0		42
1,1,2,2-Tetrachloroethane	ND	200	200	100		210	105		45-157	5		61
Benzene	ND	200	230	115		230	115		37-151	0		61
Toluene	ND	200	200	100		200	100		47-150	0		41
Ethylbenzene	ND	200	200	100		200	100		37-162	0		63
Chloromethane	ND	200	130	65		130	65		1-273	0		60
Bromomethane	ND	200	65	32		81	40		1-242	22		61

Matrix Spike Analysis**Batch Quality Control****Project Name:** BROOK STREET WWTF IPP SAMPLING**Project Number:** Not Specified**Lab Number:** L2042150**Report Date:** 10/12/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 04 QC Batch ID: WG1417940-5 WG1417940-6 QC Sample: L2042150-04 Client ID: EFFLUENT GRAB												
Vinyl chloride	ND	200	130	65		130	65		1-251	0		66
Chloroethane	ND	200	170	85		170	85		14-230	0		78
1,1-Dichloroethene	ND	200	180	90		180	90		1-234	0		32
trans-1,2-Dichloroethene	ND	200	190	95		180	90		54-156	5		45
cis-1,2-Dichloroethene	ND	200	180	90		180	90		60-140	0		30
Trichloroethene	ND	200	210	105		210	105		70-157	0		48
1,2-Dichlorobenzene	ND	200	180	90		190	95		18-190	5		57
1,3-Dichlorobenzene	ND	200	180	90		180	90		59-156	0		43
1,4-Dichlorobenzene	ND	200	190	95		180	90		18-190	5		57
p/m-Xylene	ND	400	370	92		360	90		60-140	3		30
o-xylene	ND	200	190	95		180	90		60-140	5		30
Styrene	ND	200	180	90		180	90		60-140	0		30
Acetone	ND	500	500	100		500	100		40-160	0		30
Carbon disulfide	ND	200	160	80		160	80		60-140	0		30
2-Butanone	ND	500	450	90		460	92		60-140	2		30
Vinyl acetate	ND	400	220	55	Q	220	55	Q	60-140	0		30
4-Methyl-2-pentanone	ND	500	520	104		520	104		60-140	0		30
2-Hexanone	ND	500	530	106		530	106		60-140	0		30
Acrolein	ND	400	390	98		380	95		40-160	3		30
Acrylonitrile	ND	400	430	108		440	110		40-160	2		60
Dibromomethane	ND	200	210	105		210	105		70-130	0		30

Matrix Spike Analysis**Batch Quality Control****Project Name:** BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 04 QC Batch ID: WG1417940-5 WG1417940-6 QC Sample: L2042150-04 Client ID: EFFLUENT GRAB												

Surrogate	MS % Recovery	Qualifier	MSD % Recovery	Qualifier	Acceptance Criteria
4-Bromofluorobenzene	95		96		60-140
Fluorobenzene	113		113		60-140
Pentafluorobenzene	96		98		60-140

SEMIVOLATILES

Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

SAMPLE RESULTS

Lab ID: L2042150-01 D
Client ID: INFLUENT COMPOSITE
Sample Location: BROOK STREET, AYER, MA

Date Collected: 10/02/20 07:45
Date Received: 10/02/20
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 129,625.1
Analytical Date: 10/08/20 16:46
Analyst: JG

Extraction Method: EPA 625.1
Extraction Date: 10/03/20 14:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/l	10.0	--	5
Benzidine ¹	ND		ug/l	100	--	5
1,2,4-Trichlorobenzene	ND		ug/l	25.0	--	5
Hexachlorobenzene	ND		ug/l	10.0	--	5
Bis(2-chloroethyl)ether	ND		ug/l	10.0	--	5
2-Chloronaphthalene	ND		ug/l	10.0	--	5
3,3'-Dichlorobenzidine	ND		ug/l	25.0	--	5
2,4-Dinitrotoluene	ND		ug/l	25.0	--	5
2,6-Dinitrotoluene	ND		ug/l	25.0	--	5
Azobenzene ¹	ND		ug/l	10.0	--	5
Fluoranthene	ND		ug/l	10.0	--	5
4-Chlorophenyl phenyl ether	ND		ug/l	10.0	--	5
4-Bromophenyl phenyl ether	ND		ug/l	10.0	--	5
Bis(2-chloroisopropyl)ether	ND		ug/l	10.0	--	5
Bis(2-chloroethoxy)methane	ND		ug/l	25.0	--	5
Hexachlorobutadiene	ND		ug/l	10.0	--	5
Hexachlorocyclopentadiene ¹	ND		ug/l	50.0	--	5
Hexachloroethane	ND		ug/l	10.0	--	5
Isophorone	ND		ug/l	25.0	--	5
Naphthalene	ND		ug/l	10.0	--	5
Nitrobenzene	ND		ug/l	10.0	--	5
NDPA/DPA ¹	ND		ug/l	10.0	--	5
n-Nitrosodi-n-propylamine	ND		ug/l	25.0	--	5
Bis(2-ethylhexyl)phthalate	ND		ug/l	11.0	--	5
Butyl benzyl phthalate	ND		ug/l	25.0	--	5
Di-n-butylphthalate	ND		ug/l	25.0	--	5
Di-n-octylphthalate	ND		ug/l	25.0	--	5
Diethyl phthalate	ND		ug/l	25.0	--	5

Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

SAMPLE RESULTS

Lab ID: L2042150-01 D
Client ID: INFLUENT COMPOSITE
Sample Location: BROOK STREET, AYER, MA

Date Collected: 10/02/20 07:45
Date Received: 10/02/20
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Dimethyl phthalate	ND		ug/l	25.0	--	5
Benzo(a)anthracene	ND		ug/l	10.0	--	5
Benzo(a)pyrene	ND		ug/l	10.0	--	5
Benzo(b)fluoranthene	ND		ug/l	10.0	--	5
Benzo(k)fluoranthene	ND		ug/l	10.0	--	5
Chrysene	ND		ug/l	10.0	--	5
Acenaphthylene	ND		ug/l	10.0	--	5
Anthracene	ND		ug/l	10.0	--	5
Benzo(ghi)perylene	ND		ug/l	10.0	--	5
Fluorene	ND		ug/l	10.0	--	5
Phenanthrene	ND		ug/l	10.0	--	5
Dibenzo(a,h)anthracene	ND		ug/l	10.0	--	5
Indeno(1,2,3-cd)pyrene	ND		ug/l	10.0	--	5
Pyrene	ND		ug/l	10.0	--	5
4-Chloroaniline ¹	ND		ug/l	25.0	--	5
Dibenzofuran ¹	ND		ug/l	10.0	--	5
2-Methylnaphthalene ¹	ND		ug/l	10.0	--	5
n-Nitrosodimethylamine ¹	ND		ug/l	10.0	--	5
2,4,6-Trichlorophenol	ND		ug/l	25.0	--	5
p-Chloro-m-cresol ¹	ND		ug/l	10.0	--	5
2-Chlorophenol	ND		ug/l	10.0	--	5
2,4-Dichlorophenol	ND		ug/l	25.0	--	5
2,4-Dimethylphenol	ND		ug/l	25.0	--	5
2-Nitrophenol	ND		ug/l	25.0	--	5
4-Nitrophenol	ND		ug/l	50.0	--	5
2,4-Dinitrophenol	ND		ug/l	100	--	5
4,6-Dinitro-o-cresol	ND		ug/l	50.0	--	5
Pentachlorophenol	ND		ug/l	25.0	--	5
Phenol	28.7		ug/l	25.0	--	5
2-Methylphenol ¹	ND		ug/l	25.0	--	5
3-Methylphenol/4-Methylphenol ¹	365		ug/l	25.0	--	5
2,4,5-Trichlorophenol ¹	ND		ug/l	25.0	--	5
Benzoic Acid ¹	523		ug/l	250	--	5
Benzyl Alcohol ¹	ND		ug/l	10.0	--	5

Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

SAMPLE RESULTS

Lab ID: L2042150-01 D
 Client ID: INFLUENT COMPOSITE
 Sample Location: BROOK STREET, AYER, MA

Date Collected: 10/02/20 07:45
 Date Received: 10/02/20
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	75		25-87
Phenol-d6	53		16-65
Nitrobenzene-d5	144	Q	42-122
2-Fluorobiphenyl	98		46-121
2,4,6-Tribromophenol	95		45-128
4-Terphenyl-d14	99		47-138

Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

SAMPLE RESULTS

Lab ID: L2042150-03
Client ID: EFFLUENT COMPOSITE
Sample Location: BROOK STREET, AYER, MA

Date Collected: 10/02/20 14:45
Date Received: 10/02/20
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 129,625.1
Analytical Date: 10/07/20 15:08
Analyst: SZ

Extraction Method: EPA 625.1
Extraction Date: 10/03/20 15:03

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/l	2.00	--	1
Benzidine ¹	ND		ug/l	20.0	--	1
1,2,4-Trichlorobenzene	ND		ug/l	5.00	--	1
Hexachlorobenzene	ND		ug/l	2.00	--	1
Bis(2-chloroethyl)ether	ND		ug/l	2.00	--	1
2-Chloronaphthalene	ND		ug/l	2.00	--	1
3,3'-Dichlorobenzidine	ND		ug/l	5.00	--	1
2,4-Dinitrotoluene	ND		ug/l	5.00	--	1
2,6-Dinitrotoluene	ND		ug/l	5.00	--	1
Azobenzene ¹	ND		ug/l	2.00	--	1
Fluoranthene	ND		ug/l	2.00	--	1
4-Chlorophenyl phenyl ether	ND		ug/l	2.00	--	1
4-Bromophenyl phenyl ether	ND		ug/l	2.00	--	1
Bis(2-chloroisopropyl)ether	ND		ug/l	2.00	--	1
Bis(2-chloroethoxy)methane	ND		ug/l	5.00	--	1
Hexachlorobutadiene	ND		ug/l	2.00	--	1
Hexachlorocyclopentadiene ¹	ND		ug/l	10.0	--	1
Hexachloroethane	ND		ug/l	2.00	--	1
Isophorone	ND		ug/l	5.00	--	1
Naphthalene	ND		ug/l	2.00	--	1
Nitrobenzene	ND		ug/l	2.00	--	1
NDPA/DPA ¹	ND		ug/l	2.00	--	1
n-Nitrosodi-n-propylamine	ND		ug/l	5.00	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.20	--	1
Butyl benzyl phthalate	ND		ug/l	5.00	--	1
Di-n-butylphthalate	ND		ug/l	5.00	--	1
Di-n-octylphthalate	ND		ug/l	5.00	--	1
Diethyl phthalate	ND		ug/l	5.00	--	1

Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

SAMPLE RESULTS

Lab ID: L2042150-03
Client ID: EFFLUENT COMPOSITE
Sample Location: BROOK STREET, AYER, MA

Date Collected: 10/02/20 14:45
Date Received: 10/02/20
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Dimethyl phthalate	ND		ug/l	5.00	--	1
Benzo(a)anthracene	ND		ug/l	2.00	--	1
Benzo(a)pyrene	ND		ug/l	2.00	--	1
Benzo(b)fluoranthene	ND		ug/l	2.00	--	1
Benzo(k)fluoranthene	ND		ug/l	2.00	--	1
Chrysene	ND		ug/l	2.00	--	1
Acenaphthylene	ND		ug/l	2.00	--	1
Anthracene	ND		ug/l	2.00	--	1
Benzo(ghi)perylene	ND		ug/l	2.00	--	1
Fluorene	ND		ug/l	2.00	--	1
Phenanthrene	ND		ug/l	2.00	--	1
Dibenzo(a,h)anthracene	ND		ug/l	2.00	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/l	2.00	--	1
Pyrene	ND		ug/l	2.00	--	1
4-Chloroaniline ¹	ND		ug/l	5.00	--	1
Dibenzofuran ¹	ND		ug/l	2.00	--	1
2-Methylnaphthalene ¹	ND		ug/l	2.00	--	1
n-Nitrosodimethylamine ¹	ND		ug/l	2.00	--	1
2,4,6-Trichlorophenol	ND		ug/l	5.00	--	1
p-Chloro-m-cresol ¹	ND		ug/l	2.00	--	1
2-Chlorophenol	ND		ug/l	2.00	--	1
2,4-Dichlorophenol	ND		ug/l	5.00	--	1
2,4-Dimethylphenol	ND		ug/l	5.00	--	1
2-Nitrophenol	ND		ug/l	5.00	--	1
4-Nitrophenol	ND		ug/l	10.0	--	1
2,4-Dinitrophenol	ND		ug/l	20.0	--	1
4,6-Dinitro-o-cresol	ND		ug/l	10.0	--	1
Pentachlorophenol	ND		ug/l	5.00	--	1
Phenol	17.8		ug/l	5.00	--	1
2-Methylphenol ¹	ND		ug/l	5.00	--	1
3-Methylphenol/4-Methylphenol ¹	ND		ug/l	5.00	--	1
2,4,5-Trichlorophenol ¹	ND		ug/l	5.00	--	1
Benzoic Acid ¹	ND		ug/l	50.0	--	1
Benzyl Alcohol ¹	ND		ug/l	2.00	--	1

Project Name: BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20**SAMPLE RESULTS**

Lab ID: L2042150-03

Date Collected: 10/02/20 14:45

Client ID: EFFLUENT COMPOSITE

Date Received: 10/02/20

Sample Location: BROOK STREET, AYER, MA

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	55		25-87
Phenol-d6	36		16-65
Nitrobenzene-d5	98		42-122
2-Fluorobiphenyl	67		46-121
2,4,6-Tribromophenol	69		45-128
4-Terphenyl-d14	67		47-138

Project Name: BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 10/07/20 09:42
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 10/03/20 14:55

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01,03 Batch: WG1417779-1					
Acenaphthene	ND		ug/l	2.00	--
Benzidine ¹	ND		ug/l	20.0	--
1,2,4-Trichlorobenzene	ND		ug/l	5.00	--
Hexachlorobenzene	ND		ug/l	2.00	--
Bis(2-chloroethyl)ether	ND		ug/l	2.00	--
2-Chloronaphthalene	ND		ug/l	2.00	--
3,3'-Dichlorobenzidine	ND		ug/l	5.00	--
2,4-Dinitrotoluene	ND		ug/l	5.00	--
2,6-Dinitrotoluene	ND		ug/l	5.00	--
Azobenzene ¹	ND		ug/l	2.00	--
Fluoranthene	ND		ug/l	2.00	--
4-Chlorophenyl phenyl ether	ND		ug/l	2.00	--
4-Bromophenyl phenyl ether	ND		ug/l	2.00	--
Bis(2-chloroisopropyl)ether	ND		ug/l	2.00	--
Bis(2-chloroethoxy)methane	ND		ug/l	5.00	--
Hexachlorobutadiene	ND		ug/l	2.00	--
Hexachlorocyclopentadiene ¹	ND		ug/l	10.0	--
Hexachloroethane	ND		ug/l	2.00	--
Isophorone	ND		ug/l	5.00	--
Naphthalene	ND		ug/l	2.00	--
Nitrobenzene	ND		ug/l	2.00	--
NDPA/DPA ¹	ND		ug/l	2.00	--
n-Nitrosodi-n-propylamine	ND		ug/l	5.00	--
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.20	--
Butyl benzyl phthalate	ND		ug/l	5.00	--
Di-n-butylphthalate	ND		ug/l	5.00	--
Di-n-octylphthalate	ND		ug/l	5.00	--
Diethyl phthalate	ND		ug/l	5.00	--
Dimethyl phthalate	ND		ug/l	5.00	--

Project Name: BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 10/07/20 09:42
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 10/03/20 14:55

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01,03 Batch: WG1417779-1					
Benzo(a)anthracene	ND		ug/l	2.00	--
Benzo(a)pyrene	ND		ug/l	2.00	--
Benzo(b)fluoranthene	ND		ug/l	2.00	--
Benzo(k)fluoranthene	ND		ug/l	2.00	--
Chrysene	ND		ug/l	2.00	--
Acenaphthylene	ND		ug/l	2.00	--
Anthracene	ND		ug/l	2.00	--
Benzo(ghi)perylene	ND		ug/l	2.00	--
Fluorene	ND		ug/l	2.00	--
Phenanthrene	ND		ug/l	2.00	--
Dibenzo(a,h)anthracene	ND		ug/l	2.00	--
Indeno(1,2,3-cd)pyrene	ND		ug/l	2.00	--
Pyrene	ND		ug/l	2.00	--
4-Chloroaniline ¹	ND		ug/l	5.00	--
Dibenzofuran ¹	ND		ug/l	2.00	--
2-Methylnaphthalene ¹	ND		ug/l	2.00	--
n-Nitrosodimethylamine ¹	ND		ug/l	2.00	--
2,4,6-Trichlorophenol	ND		ug/l	5.00	--
p-Chloro-m-cresol ¹	ND		ug/l	2.00	--
2-Chlorophenol	ND		ug/l	2.00	--
2,4-Dichlorophenol	ND		ug/l	5.00	--
2,4-Dimethylphenol	ND		ug/l	5.00	--
2-Nitrophenol	ND		ug/l	5.00	--
4-Nitrophenol	ND		ug/l	10.0	--
2,4-Dinitrophenol	ND		ug/l	20.0	--
4,6-Dinitro-o-cresol	ND		ug/l	10.0	--
Pentachlorophenol	ND		ug/l	5.00	--
Phenol	ND		ug/l	5.00	--
2-Methylphenol ¹	ND		ug/l	5.00	--

Project Name: BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20**Method Blank Analysis**
Batch Quality ControlAnalytical Method: 129,625.1
Analytical Date: 10/07/20 09:42
Analyst: SZExtraction Method: EPA 625.1
Extraction Date: 10/03/20 14:55

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01,03 Batch: WG1417779-1					
3-Methylphenol/4-Methylphenol ¹	ND		ug/l	5.00	--
2,4,5-Trichlorophenol ¹	ND		ug/l	5.00	--
Benzoic Acid ¹	ND		ug/l	50.0	--
Benzyl Alcohol ¹	ND		ug/l	2.00	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	52		25-87
Phenol-d6	32		16-65
Nitrobenzene-d5	93		42-122
2-Fluorobiphenyl	66		46-121
2,4,6-Tribromophenol	54		45-128
4-Terphenyl-d14	68		47-138

Lab Control Sample Analysis **Batch Quality Control**

Project Name: BROOK STREET WWTF IPP SAMPLING

Lab Number: L2042150

Project Number: Not Specified

Report Date: 10/12/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01,03 Batch: WG1417779-3								
Acenaphthene	72		-		60-132	-		48
Benzidine ¹	6		-		0-70	-		30
1,2,4-Trichlorobenzene	63		-		57-130	-		50
Hexachlorobenzene	65		-		8-142	-		55
Bis(2-chloroethyl)ether	71		-		43-126	-		108
2-Chloronaphthalene	73		-		65-120	-		24
3,3'-Dichlorobenzidine	34		-		8-213	-		108
2,4-Dinitrotoluene	81		-		48-127	-		42
2,6-Dinitrotoluene	84		-		68-137	-		48
Azobenzene ¹	68		-		44-115	-		23
Fluoranthene	77		-		43-121	-		66
4-Chlorophenyl phenyl ether	72		-		38-145	-		61
4-Bromophenyl phenyl ether	71		-		65-120	-		43
Bis(2-chloroisopropyl)ether	63		-		63-139	-		76
Bis(2-chloroethoxy)methane	70		-		49-165	-		54
Hexachlorobutadiene	60		-		38-120	-		62
Hexachlorocyclopentadiene ¹	60		-		7-118	-		35
Hexachloroethane	57		-		55-120	-		52
Isophorone	68		-		47-180	-		93
Naphthalene	67		-		36-120	-		65
Nitrobenzene	67		-		54-158	-		62
NDPA/DPA ¹	75		-		45-112	-		36
n-Nitrosodi-n-propylamine	73		-		14-198	-		87

Lab Control Sample Analysis **Batch Quality Control**

Project Name: BROOK STREET WWTF IPP SAMPLING

Lab Number: L2042150

Project Number: Not Specified

Report Date: 10/12/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01,03 Batch: WG1417779-3								
Bis(2-ethylhexyl)phthalate	85		-		29-137	-		82
Butyl benzyl phthalate	81		-		1-140	-		60
Di-n-butylphthalate	82		-		8-120	-		47
Di-n-octylphthalate	85		-		19-132	-		69
Diethyl phthalate	72		-		1-120	-		100
Dimethyl phthalate	76		-		1-120	-		183
Benzo(a)anthracene	80		-		42-133	-		53
Benzo(a)pyrene	84		-		32-148	-		72
Benzo(b)fluoranthene	80		-		42-140	-		71
Benzo(k)fluoranthene	80		-		25-146	-		63
Chrysene	75		-		44-140	-		87
Acenaphthylene	74		-		54-126	-		74
Anthracene	77		-		43-120	-		66
Benzo(ghi)perylene	81		-		1-195	-		97
Fluorene	72		-		70-120	-		38
Phenanthrene	73		-		65-120	-		39
Dibenzo(a,h)anthracene	78		-		1-200	-		126
Indeno(1,2,3-cd)pyrene	83		-		1-151	-		99
Pyrene	75		-		70-120	-		49
4-Chloroaniline ¹	39		-		10-100	-		53
Dibenzofuran ¹	71		-		23-126	-		22
2-Methylnaphthalene ¹	68		-		40-109	-		18
n-Nitrosodimethylamine ¹	50		-		15-68	-		17

Lab Control Sample Analysis**Batch Quality Control****Project Name:** BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01,03 Batch: WG1417779-3								
2,4,6-Trichlorophenol	84		-		52-129	-		58
p-Chloro-m-cresol ¹	79		-		68-130	-		73
2-Chlorophenol	73		-		36-120	-		61
2,4-Dichlorophenol	80		-		53-122	-		50
2,4-Dimethylphenol	59		-		42-120	-		58
2-Nitrophenol	82		-		45-167	-		55
4-Nitrophenol	48		-		13-129	-		131
2,4-Dinitrophenol	73		-		1-173	-		132
4,6-Dinitro-o-cresol	84		-		56-130	-		203
Pentachlorophenol	68		-		38-152	-		86
Phenol	44		-		17-120	-		64
2-Methylphenol ¹	67		-		38-102	-		23
3-Methylphenol/4-Methylphenol ¹	74		-		35-103	-		26
2,4,5-Trichlorophenol ¹	83		-		47-126	-		28
Benzoic Acid ¹	37		-		2-55	-		27
Benzyl Alcohol ¹	66		-		31-103	-		23

Lab Control Sample Analysis**Batch Quality Control****Project Name:** BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
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Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01,03 Batch: WG1417779-3

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	57				25-87
Phenol-d6	46				16-65
Nitrobenzene-d5	74				42-122
2-Fluorobiphenyl	79				46-121
2,4,6-Tribromophenol	69				45-128
4-Terphenyl-d14	75				47-138

METALS

Project Name: BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20**SAMPLE RESULTS**

Lab ID: L2042150-01

Date Collected: 10/02/20 07:45

Client ID: INFLUENT COMPOSITE

Date Received: 10/02/20

Sample Location: BROOK STREET, AYER, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	ND		mg/l	0.100	--	1	10/07/20 06:36	10/11/20 12:32	EPA 3005A	19,200.7	GD
Antimony, Total	ND		mg/l	0.050	--	1	10/07/20 06:36	10/11/20 12:32	EPA 3005A	19,200.7	GD
Arsenic, Total	0.032		mg/l	0.005	--	1	10/07/20 06:36	10/11/20 12:32	EPA 3005A	19,200.7	GD
Beryllium, Total	ND		mg/l	0.005	--	1	10/07/20 06:36	10/11/20 12:32	EPA 3005A	19,200.7	GD
Cadmium, Total	ND		mg/l	0.005	--	1	10/07/20 06:36	10/11/20 12:32	EPA 3005A	19,200.7	GD
Chromium, Total	ND		mg/l	0.010	--	1	10/07/20 06:36	10/11/20 12:32	EPA 3005A	19,200.7	GD
Copper, Total	0.030		mg/l	0.010	--	1	10/07/20 06:36	10/11/20 12:32	EPA 3005A	19,200.7	GD
Lead, Total	ND		mg/l	0.010	--	1	10/07/20 06:36	10/11/20 12:32	EPA 3005A	19,200.7	GD
Mercury, Total	ND		mg/l	0.00020	--	1	10/07/20 09:18	10/07/20 13:30	EPA 245.1	3,245.1	EW
Molybdenum, Total	ND		mg/l	0.050	--	1	10/07/20 06:36	10/11/20 12:32	EPA 3005A	19,200.7	GD
Nickel, Total	ND		mg/l	0.025	--	1	10/07/20 06:36	10/11/20 12:32	EPA 3005A	19,200.7	GD
Selenium, Total	ND		mg/l	0.010	--	1	10/07/20 06:36	10/11/20 12:32	EPA 3005A	19,200.7	GD
Silver, Total	ND		mg/l	0.007	--	1	10/07/20 06:36	10/11/20 12:32	EPA 3005A	19,200.7	GD
Thallium, Total	ND		mg/l	0.020	--	1	10/07/20 06:36	10/11/20 12:32	EPA 3005A	19,200.7	GD
Zinc, Total	0.057		mg/l	0.050	--	1	10/07/20 06:36	10/11/20 12:32	EPA 3005A	19,200.7	GD



Project Name: BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20**SAMPLE RESULTS**

Lab ID: L2042150-03

Date Collected: 10/02/20 14:45

Client ID: EFFLUENT COMPOSITE

Date Received: 10/02/20

Sample Location: BROOK STREET, AYER, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	ND		mg/l	0.100	--	1	10/07/20 06:36	10/11/20 12:37	EPA 3005A	19,200.7	GD
Antimony, Total	ND		mg/l	0.050	--	1	10/07/20 06:36	10/11/20 12:37	EPA 3005A	19,200.7	GD
Arsenic, Total	ND		mg/l	0.005	--	1	10/07/20 06:36	10/11/20 12:37	EPA 3005A	19,200.7	GD
Beryllium, Total	ND		mg/l	0.005	--	1	10/07/20 06:36	10/11/20 12:37	EPA 3005A	19,200.7	GD
Cadmium, Total	ND		mg/l	0.005	--	1	10/07/20 06:36	10/11/20 12:37	EPA 3005A	19,200.7	GD
Chromium, Total	ND		mg/l	0.010	--	1	10/07/20 06:36	10/11/20 12:37	EPA 3005A	19,200.7	GD
Copper, Total	ND		mg/l	0.010	--	1	10/07/20 06:36	10/11/20 12:37	EPA 3005A	19,200.7	GD
Lead, Total	ND		mg/l	0.010	--	1	10/07/20 06:36	10/11/20 12:37	EPA 3005A	19,200.7	GD
Mercury, Total	ND		mg/l	0.00020	--	1	10/07/20 09:18	10/07/20 13:32	EPA 245.1	3,245.1	EW
Molybdenum, Total	ND		mg/l	0.050	--	1	10/07/20 06:36	10/11/20 12:37	EPA 3005A	19,200.7	GD
Nickel, Total	ND		mg/l	0.025	--	1	10/07/20 06:36	10/11/20 12:37	EPA 3005A	19,200.7	GD
Selenium, Total	ND		mg/l	0.010	--	1	10/07/20 06:36	10/11/20 12:37	EPA 3005A	19,200.7	GD
Silver, Total	ND		mg/l	0.007	--	1	10/07/20 06:36	10/11/20 12:37	EPA 3005A	19,200.7	GD
Thallium, Total	ND		mg/l	0.020	--	1	10/07/20 06:36	10/11/20 12:37	EPA 3005A	19,200.7	GD
Zinc, Total	ND		mg/l	0.050	--	1	10/07/20 06:36	10/11/20 12:37	EPA 3005A	19,200.7	GD



Project Name: BROOK STREET WWTF IPP SAMPLING

Lab Number: L2042150

Project Number: Not Specified

Report Date: 10/12/20

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01,03 Batch: WG1418746-1										
Aluminum, Total	ND		mg/l	0.100	--	1	10/07/20 06:36	10/11/20 10:36	19,200.7	GD
Antimony, Total	ND		mg/l	0.050	--	1	10/07/20 06:36	10/11/20 10:36	19,200.7	GD
Arsenic, Total	ND		mg/l	0.005	--	1	10/07/20 06:36	10/11/20 10:36	19,200.7	GD
Beryllium, Total	ND		mg/l	0.005	--	1	10/07/20 06:36	10/11/20 10:36	19,200.7	GD
Cadmium, Total	ND		mg/l	0.005	--	1	10/07/20 06:36	10/11/20 10:36	19,200.7	GD
Chromium, Total	ND		mg/l	0.010	--	1	10/07/20 06:36	10/11/20 10:36	19,200.7	GD
Copper, Total	ND		mg/l	0.010	--	1	10/07/20 06:36	10/11/20 10:36	19,200.7	GD
Lead, Total	ND		mg/l	0.010	--	1	10/07/20 06:36	10/11/20 10:36	19,200.7	GD
Molybdenum, Total	ND		mg/l	0.050	--	1	10/07/20 06:36	10/11/20 10:36	19,200.7	GD
Nickel, Total	ND		mg/l	0.025	--	1	10/07/20 06:36	10/11/20 10:36	19,200.7	GD
Selenium, Total	ND		mg/l	0.010	--	1	10/07/20 06:36	10/11/20 10:36	19,200.7	GD
Silver, Total	ND		mg/l	0.007	--	1	10/07/20 06:36	10/11/20 10:36	19,200.7	GD
Thallium, Total	ND		mg/l	0.020	--	1	10/07/20 06:36	10/11/20 10:36	19,200.7	GD
Zinc, Total	ND		mg/l	0.050	--	1	10/07/20 06:36	10/11/20 10:36	19,200.7	GD

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01,03 Batch: WG1418752-1										
Mercury, Total	ND		mg/l	0.00020	--	1	10/07/20 09:18	10/07/20 12:53	3,245.1	EW

Prep Information

Digestion Method: EPA 245.1

Lab Control Sample Analysis**Batch Quality Control****Project Name:** BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01,03 Batch: WG1418746-2								
Aluminum, Total	104		-		85-115	-		
Antimony, Total	103		-		85-115	-		
Arsenic, Total	109		-		85-115	-		
Beryllium, Total	105		-		85-115	-		
Cadmium, Total	111		-		85-115	-		
Chromium, Total	100		-		85-115	-		
Copper, Total	101		-		85-115	-		
Lead, Total	108		-		85-115	-		
Molybdenum, Total	99		-		85-115	-		
Nickel, Total	99		-		85-115	-		
Selenium, Total	108		-		85-115	-		
Silver, Total	101		-		85-115	-		
Thallium, Total	103		-		85-115	-		
Zinc, Total	108		-		85-115	-		

Total Metals - Mansfield Lab Associated sample(s): 01,03 Batch: WG1418752-2

Mercury, Total	106		-		85-115	-		
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Matrix Spike Analysis **Batch Quality Control**

Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01,03 QC Batch ID: WG1418746-3 QC Sample: L2041953-01 Client ID: MS Sample												
Aluminum, Total	ND	2	2.21	110		-	-		75-125	-		20
Antimony, Total	ND	0.5	0.576	115		-	-		75-125	-		20
Arsenic, Total	0.010	0.12	0.149	116		-	-		75-125	-		20
Beryllium, Total	ND	0.05	0.055	109		-	-		75-125	-		20
Cadmium, Total	ND	0.051	0.059	115		-	-		75-125	-		20
Chromium, Total	ND	0.2	0.205	102		-	-		75-125	-		20
Copper, Total	ND	0.25	0.271	108		-	-		75-125	-		20
Lead, Total	ND	0.51	0.557	109		-	-		75-125	-		20
Molybdenum, Total	ND	1	1.03	103		-	-		75-125	-		20
Nickel, Total	0.041	0.5	0.545	101		-	-		75-125	-		20
Selenium, Total	ND	0.12	0.138	115		-	-		75-125	-		20
Silver, Total	ND	0.05	0.053	106		-	-		75-125	-		20
Thallium, Total	ND	0.12	0.123	102		-	-		75-125	-		20
Zinc, Total	ND	0.5	0.579	116		-	-		75-125	-		20

Matrix Spike Analysis **Batch Quality Control**

Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01,03 QC Batch ID: WG1418746-7 QC Sample: L2041953-02 Client ID: MS Sample									
Aluminum, Total	ND	2	2.21	110	-	-	75-125	-	20
Antimony, Total	ND	0.5	0.571	114	-	-	75-125	-	20
Arsenic, Total	ND	0.12	0.140	117	-	-	75-125	-	20
Beryllium, Total	ND	0.05	0.054	108	-	-	75-125	-	20
Cadmium, Total	ND	0.051	0.058	113	-	-	75-125	-	20
Chromium, Total	ND	0.2	0.202	101	-	-	75-125	-	20
Copper, Total	ND	0.25	0.260	104	-	-	75-125	-	20
Lead, Total	ND	0.51	0.549	108	-	-	75-125	-	20
Molybdenum, Total	ND	1	1.00	100	-	-	75-125	-	20
Nickel, Total	ND	0.5	0.496	99	-	-	75-125	-	20
Selenium, Total	ND	0.12	0.132	110	-	-	75-125	-	20
Silver, Total	ND	0.05	0.052	104	-	-	75-125	-	20
Thallium, Total	ND	0.12	0.122	102	-	-	75-125	-	20
Zinc, Total	ND	0.5	0.565	113	-	-	75-125	-	20
Total Metals - Mansfield Lab Associated sample(s): 01,03 QC Batch ID: WG1418752-3 QC Sample: L2042000-01 Client ID: MS Sample									
Mercury, Total	0.00074	0.005	0.00536	92	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01,03 QC Batch ID: WG1418752-5 QC Sample: L2042000-02 Client ID: MS Sample									
Mercury, Total	ND	0.005	0.00354	71	-	-	70-130	-	20

Project Name: BROOK STREET WWTF IPP SAMPLING

Project Number: Not Specified

Lab Duplicate Analysis

Batch Quality Control

Lab Number: L2042150

Report Date: 10/12/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01,03 QC Batch ID: WG1418752-4 QC Sample: L2042000-01 Client ID: DUP Sample						
Mercury, Total	0.00074	0.00081	mg/l	9		20
Total Metals - Mansfield Lab Associated sample(s): 01,03 QC Batch ID: WG1418752-6 QC Sample: L2042000-02 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20

INORGANICS & MISCELLANEOUS

Project Name: BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20**SAMPLE RESULTS****Lab ID:** L2042150-01**Date Collected:** 10/02/20 07:45**Client ID:** INFLUENT COMPOSITE**Date Received:** 10/02/20**Sample Location:** BROOK STREET, AYER, MA**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	14.8		mg/l	0.150	--	2	10/06/20 12:17	10/06/20 23:17	121,4500NH3-BH	AT
Phosphorus, Total	2.83		mg/l	0.125	--	12.5	10/09/20 06:00	10/09/20 10:04	121,4500P-E	MV



Project Name: BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20**SAMPLE RESULTS****Lab ID:** L2042150-02**Date Collected:** 10/02/20 07:45**Client ID:** INFLUENT GRAB**Date Received:** 10/02/20**Sample Location:** BROOK STREET, AYER, MA**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Total	ND		mg/l	0.005	--	1	10/03/20 16:20	10/05/20 11:38	121,4500CN-CE	AG
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	10/09/20 08:51	10/09/20 09:30	74,1664A	DR
Chromium, Hexavalent	ND		mg/l	0.010	--	1	10/03/20 07:00	10/03/20 07:29	121,3500CR-B	MA



Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

SAMPLE RESULTS

Lab ID: L2042150-03
Client ID: EFFLUENT COMPOSITE
Sample Location: BROOK STREET, AYER, MA

Date Collected: 10/02/20 14:45
Date Received: 10/02/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	0.110		mg/l	0.075	--	1	10/06/20 12:17	10/06/20 23:18	121,4500NH3-BH	AT
Phosphorus, Total	0.137		mg/l	0.010	--	1	10/04/20 10:00	10/06/20 06:45	121,4500P-E	MV



Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

SAMPLE RESULTS

Lab ID: L2042150-04
Client ID: EFFLUENT GRAB
Sample Location: BROOK STREET, AYER, MA

Date Collected: 10/02/20 14:45
Date Received: 10/02/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Total	0.005		mg/l	0.005	--	1	10/03/20 16:20	10/05/20 11:40	121,4500CN-CE	AG
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	10/09/20 08:51	10/09/20 09:30	74,1664A	DR
Chromium, Hexavalent	ND		mg/l	0.010	--	1	10/03/20 07:00	10/03/20 07:30	121,3500CR-B	MA



Project Name: BROOK STREET WWTF IPP SAMPLIN
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 02,04 Batch: WG1417663-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	10/03/20 07:00	10/03/20 07:28	121,3500CR-B	MA
General Chemistry - Westborough Lab for sample(s): 02,04 Batch: WG1417784-1										
Cyanide, Total	ND		mg/l	0.005	--	1	10/03/20 16:20	10/05/20 11:13	121,4500CN-CE	AG
General Chemistry - Westborough Lab for sample(s): 03 Batch: WG1418015-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	10/04/20 10:00	10/06/20 06:18	121,4500P-E	MV
General Chemistry - Westborough Lab for sample(s): 01,03 Batch: WG1418506-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	10/06/20 12:17	10/06/20 23:05	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1420072-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	10/09/20 06:00	10/09/20 09:16	121,4500P-E	MV
General Chemistry - Westborough Lab for sample(s): 02,04 Batch: WG1420167-1										
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	10/09/20 08:51	10/09/20 09:30	74,1664A	DR

Lab Control Sample Analysis**Batch Quality Control****Project Name:** BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02,04 Batch: WG1417663-2								
Chromium, Hexavalent	104		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 02,04 Batch: WG1417784-2								
Cyanide, Total	98		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 03 Batch: WG1418015-2								
Phosphorus, Total	97		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01,03 Batch: WG1418506-2								
Nitrogen, Ammonia	84		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1420072-2								
Phosphorus, Total	95		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 02,04 Batch: WG1420167-2								
Oil & Grease, Hem-Grav	92		-		78-114	-		18

Matrix Spike Analysis **Batch Quality Control**

Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02,04 QC Batch ID: WG1417663-4 QC Sample: L2042150-04 Client ID: EFFLUENT GRAB												
Chromium, Hexavalent	ND	0.1	0.103	103		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 02,04 QC Batch ID: WG1417784-4 QC Sample: L2042150-04 Client ID: EFFLUENT GRAB												
Cyanide, Total	0.005	0.2	0.192	93		-	-		90-110	-		30
General Chemistry - Westborough Lab Associated sample(s): 03 QC Batch ID: WG1418015-4 QC Sample: L2042101-01 Client ID: MS Sample												
Phosphorus, Total	0.060	0.5	0.562	100		-	-		75-125	-		20
General Chemistry - Westborough Lab Associated sample(s): 01,03 QC Batch ID: WG1418506-4 QC Sample: L2041755-01 Client ID: MS Sample												
Nitrogen, Ammonia	ND	4	3.25	81		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1420072-4 QC Sample: L2042842-02 Client ID: MS Sample												
Phosphorus, Total	0.066	0.5	0.572	101		-	-		75-125	-		20
General Chemistry - Westborough Lab Associated sample(s): 02,04 QC Batch ID: WG1420167-4 QC Sample: L2041865-55 Client ID: MS Sample												
Oil & Grease, Hem-Grav	7.2	39.6	64	144	Q	-	-		78-114	-		18

Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Duplicate Analysis

Batch Quality Control

Lab Number: L2042150
Report Date: 10/12/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02,04 QC Batch ID: WG1417663-3 QC Sample: L2042150-04 Client ID: EFFLUENT GRAB						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 02,04 QC Batch ID: WG1417784-3 QC Sample: L2042150-02 Client ID: INFLUENT GRAB						
Cyanide, Total	ND	ND	mg/l	NC		30
General Chemistry - Westborough Lab Associated sample(s): 03 QC Batch ID: WG1418015-3 QC Sample: L2042101-01 Client ID: DUP Sample						
Phosphorus, Total	0.060	0.058	mg/l	3		20
General Chemistry - Westborough Lab Associated sample(s): 01,03 QC Batch ID: WG1418506-3 QC Sample: L2041755-01 Client ID: DUP Sample						
Nitrogen, Ammonia	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1420072-3 QC Sample: L2042842-02 Client ID: DUP Sample						
Phosphorus, Total	0.066	0.064	mg/l	3		20
General Chemistry - Westborough Lab Associated sample(s): 02,04 QC Batch ID: WG1420167-3 QC Sample: L2041865-54 Client ID: DUP Sample						
Oil & Grease, Hem-Grav	ND	8.0	mg/l	NC		18

Project Name: BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2042150-01A	Plastic 250ml HNO3 preserved	A	<2	<2	2.1	Y	Absent		MO-UI(180),NI-UI(180),SB-UI(180),ZN-UI(180),AG-UI(180),SE-UI(180),HG-U(28),CD-UI(180),AL-UI(180),BE-UI(180),CR-UI(180),TL-UI(180),AS-UI(180),CU-UI(180),PB-UI(180)
L2042150-01B	Amber 1000ml Na2S2O3	A	7	7	2.1	Y	Absent		625.1(7)
L2042150-01C	Amber 1000ml Na2S2O3	A	7	7	2.1	Y	Absent		625.1(7)
L2042150-01D	Amber 1000ml Na2S2O3	A	7	7	2.1	Y	Absent		625.1(7)
L2042150-01E	Plastic 500ml H2SO4 preserved	A	<2	<2	2.1	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2042150-02A	Vial Na2S2O3 preserved	A	NA		2.1	Y	Absent		624.1-MWRA(3)
L2042150-02B	Vial Na2S2O3 preserved	A	NA		2.1	Y	Absent		624.1-MWRA(3)
L2042150-02C	Vial Na2S2O3 preserved	A	NA		2.1	Y	Absent		624.1-MWRA(3)
L2042150-02D	Plastic 250ml unpreserved	A	7	7	2.1	Y	Absent		HEXCR-3500(1)
L2042150-02E	Amber 1000ml HCl preserved	A	NA		2.1	Y	Absent		OG-1664(28)
L2042150-02F	Amber 1000ml HCl preserved	A	NA		2.1	Y	Absent		OG-1664(28)
L2042150-02G	Plastic 250ml NaOH preserved	A	>12	>12	2.1	Y	Absent		TCN-4500(14)
L2042150-03A	Plastic 250ml HNO3 preserved	A	7	<2	2.1	N	Absent		NI-UI(180),SB-UI(180),MO-UI(180),AG-UI(180),ZN-UI(180),SE-UI(180),HG-U(28),CD-UI(180),BE-UI(180),CR-UI(180),AL-UI(180),AS-UI(180),CU-UI(180),PB-UI(180),TL-UI(180)
L2042150-03B	Amber 1000ml Na2S2O3	A	7	7	2.1	Y	Absent		625.1(7)
L2042150-03C	Amber 1000ml Na2S2O3	A	7	7	2.1	Y	Absent		625.1(7)
L2042150-03D	Amber 1000ml Na2S2O3	A	7	7	2.1	Y	Absent		625.1(7)
L2042150-03E	Plastic 500ml H2SO4 preserved	A	<2	<2	2.1	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L2042150-04A	Vial Na2S2O3 preserved	A	NA		2.1	Y	Absent		624.1-MWRA(3)
L2042150-04B	Vial Na2S2O3 preserved	A	NA		2.1	Y	Absent		624.1-MWRA(3)
L2042150-04C	Vial Na2S2O3 preserved	A	NA		2.1	Y	Absent		624.1-MWRA(3)

Project Name: BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2042150-04D	Plastic 250ml unpreserved	A	7	7	2.1	Y	Absent		HEXCR-3500(1)
L2042150-04E	Amber 1000ml HCl preserved	A	NA		2.1	Y	Absent		OG-1664(28)
L2042150-04F	Amber 1000ml HCl preserved	A	NA		2.1	Y	Absent		OG-1664(28)
L2042150-04G	Plastic 250ml NaOH preserved	A	>12	>12	2.1	Y	Absent		TCN-4500(14)

Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.

Report Format: Data Usability Report



Project Name: BROOK STREET WWTF IPP SAMPLING**Lab Number:** L2042150**Project Number:** Not Specified**Report Date:** 10/12/20**Data Qualifiers**

- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: BROOK STREET WWTF IPP SAMPLING
Project Number: Not Specified

Lab Number: L2042150
Report Date: 10/12/20

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 19 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.
- 74 Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil & Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002, February 1999.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.
- 128 Method 624.1: Purgeables by GC/MS, EPA 821-R-16-008, December 2016.
- 129 Method 625.1: Base/Neutrals and Acids by GC/MS, EPA 821-R-16-007, December 2016.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Alpha Analytical, Inc.

ID No.:17873

Facility: **Company-wide**

Revision 17

Department: **Quality Assurance**

Published Date: 4/28/2020 9:42:21 AM

Title: **Certificate/Approval Program Summary**

Page 1 of 1

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene**EPA 8260C:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.**EPA 8270D:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.**SM4500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.**Mansfield Facility****SM 2540D:** TSS**EPA 8082A:** NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

EPA TO-12 Non-methane organics**EPA 3C** Fixed gases**Biological Tissue Matrix:** EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:**Drinking Water****EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,****EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B****EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.**Microbiology:** **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.****Non-Potable Water****SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:**Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,****SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.**EPA 624.1:** Volatile Halocarbons & Aromatics,**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.****Mansfield Facility:****Drinking Water****EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.**EPA 522.****Non-Potable Water****EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.**EPA 245.1** Hg.**SM2340B**

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



EST Associates, Inc.
124 Crescent Road
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Laboratory:

Alpha Analytical Labs
(508) 898-9220

Lab Invoice To: EST

Lab Report To:

Hoyle Tanner

EST Invoice To: Hoyle Tanner

5555-Q#

Q#01409 PO#27573

Site: Brook Street Wastewater Treatment Facility

Client: Hoyle, Tanner & Associates, Inc.

Address: Brook Street

Address: 150 Dow Street

Ayer MA 01432-

Manchester NH 03101-

Contact: Rick Hudson

Contact: Paula Boyle

Phone #: (978) 772-8243

Phone #: (603) 669-5555

☐ Rush ____ Day Turnaround

Description: Town of Ayer IPP Sampling (Influent)

Fax #: (603) 669-4168

LOCATION (Sample Identification)	Sample Type	Container			Sampling		Preservative *	Laboratory Analysis	Notes					
		Size	Type	#	Date	Time								
Influent Composite (Time)	1	250 ml	P	1	10/1-2	0745-0745	HNO3	Total Metals *See Comments*	pH = 7.02					
Influent Composite	1	1 L	G	3	↓	↓	Na2S2O3	Semi-VOA (625.1)	Flow = 1266500					
Influent Composite	1	500 ml	P	1	↓	↓	H2SO4	NH3, T-Phos	Temp = 19.3					
Influent Grab	1	250 ml	P	1	10/2	0745	NaOH	Total CN						
Influent Grab (4x)	1	1 L	G	2	10/1-2	0745-0745	HCl	Oil & Grease						
Influent Grab	1	500 ml	P	1	10/2	0745	None	CrVI						
Influent Grab	1	40 ml	V	3	↓	↓	Na2S2O3	VOA (624.1)						
Sampler's Name (Print)		Signature			DATE	TIME	NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME			
Matt Gould		Matt Gould			10/2/20	1430	1	Matt Gould		10/2/20	1613			
Additional Comments: *Metals to Include" Al,As,Cd,Cu,Cr,Pb,Hg,Ni,Se,Ag,Tl,Zn,Sb,Be, Mo. *Please use lowest possible detection limit for each parameter.								2						
								3						
								4						
								5						
*All samples chilled to 4 degrees celsius.														



Associates, Inc.

EST Associates, Inc.
124 Crescent Road
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Laboratory:

Alpha Analytical Labs
(508) 898-9220

Lab Invoice To: EST

Hoyle Tanner

Lab Report To:

EST Invoice To: Hoyle Tanner

5555-Q#

Q#01409 PO#27573

Site: Brook Street Wastewater Treatment Facility**Client:** Hoyle, Tanner & Associates, Inc.**Address:** Brook Street**Address:** 150 Dow Street

Ayer MA 01432-

Manchester NH 03101-

Contact: Rick Hudson**Contact:** Paula Boyle**Phone #:** (978) 772-8243**Phone #:** (603) 669-5555☐ Rush ____ Day Turnaround**Description:** Town of Ayer IPP Sampling (Effluent)**Fax #:** (603) 669-4168

LOCATION (Sample Identification)	Sample Type	Container			Sampling		Preservative *	Laboratory Analysis	Notes					
		Size	Type	#	Date	Time								
Effluent Composite (Time)	1	250 ml	P	1	10/1-2	1445	HNO3	Total Metals *See Comments Below*	pH = 7.72					
Effluent Composite	1	1 L	G	3	↓	↓	Na2S2O3	Semi-VOA (625.1)	Flow = 1266500					
Effluent Composite	1	500 ml	P	1	↓	↓	H2SO4	NH3, T-Phos	Temp = 18.6					
Effluent Grab	1	40 ml	V	3	10/2	1445	Na2S2O3	VOA (624.1)						
Effluent Grab	1	250 ml	P	1	10/2	↓	NaOH	Total CN						
Effluent Grab (4x)	1	1 L	G	2	10/1-2	0800-1445	HCl	Oil & Grease						
Effluent Grab	1	500 ml	P	1	10/2	1445	None	CrVI						
Sampler's Name (Print)		Signature			DATE	TIME	NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME			
Matt Gould		Matt A			10/2/20	1445	1	Matt A		10/2/20	1615			
Additional Comments: Total Metals to include: Al, Sb, As, Be, Cd, Cu, Cr, Pb, Hg, Mo, Ni, Se, Ag, Ti, Zn *Please use lowest possible detection limit for each parameter.							2							
							3							
							4							
							5							
*All samples chilled to 4 degrees celsius.														



ANALYTICAL REPORT

Lab Number:	L2041890
Client:	EST Associates, Inc. 124 Crescent Road Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	TOWN OF AYER IPP SAMPLING
Project Number:	Not Specified
Report Date:	10/12/20

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: TOWN OF AYER IPP SAMPLING
Project Number: Not Specified

Lab Number: L2041890
Report Date: 10/12/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2041890-01	SLUDGE GRAB	SLUDGE	BROOK STREET, AYER, MA	10/01/20 13:00	10/02/20

Project Name: TOWN OF AYER IPP SAMPLING
Project Number: Not Specified

Lab Number: L2041890
Report Date: 10/12/20

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: TOWN OF AYER IPP SAMPLING
Project Number: Not Specified

Lab Number: L2041890
Report Date: 10/12/20

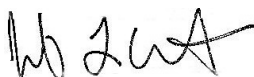
Case Narrative (continued)

Phosphorus, Total

The WG1420075-4 MS recovery, performed on L2041890-01, is outside the acceptance criteria for phosphorus, total (69%); however, the associated LCS recovery is within criteria. No further action was taken. The WG1420075-3 Laboratory Duplicate RPD for phosphorus, total (22%), performed on L2041890-01, is outside the acceptance criteria. The elevated RPD has been attributed to the non-homogeneous nature of the native sample.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Jennifer L. Clements

Title: Technical Director/Representative

Date: 10/12/20

ORGANICS

PCBS

Project Name: TOWN OF AYER IPP SAMPLING
Project Number: Not Specified

Lab Number: L2041890
Report Date: 10/12/20

SAMPLE RESULTS

Lab ID: L2041890-01
Client ID: SLUDGE GRAB
Sample Location: BROOK STREET, AYER, MA

Date Collected: 10/01/20 13:00
Date Received: 10/02/20
Field Prep: Not Specified

Sample Depth:

Matrix: Sludge
Analytical Method: 1,8082A
Analytical Date: 10/09/20 15:29
Analyst: KB
Percent Solids: 3%

Extraction Method: EPA 3540C
Extraction Date: 10/08/20 19:50
Cleanup Method: EPA 3665A
Cleanup Date: 10/09/20
Cleanup Method: EPA 3660B
Cleanup Date: 10/09/20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	2710	--	1	A
Aroclor 1221	ND		ug/kg	2710	--	1	A
Aroclor 1232	ND		ug/kg	2710	--	1	A
Aroclor 1242	ND		ug/kg	2710	--	1	A
Aroclor 1248	ND		ug/kg	2710	--	1	A
Aroclor 1254	ND		ug/kg	2710	--	1	A
Aroclor 1260	ND		ug/kg	2710	--	1	A
Aroclor 1262	ND		ug/kg	2710	--	1	A
Aroclor 1268	ND		ug/kg	2710	--	1	A
PCBs, Total	ND		ug/kg	2710	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	61		30-150	B
Decachlorobiphenyl	53		30-150	B
2,4,5,6-Tetrachloro-m-xylene	62		30-150	A
Decachlorobiphenyl	68		30-150	A

Project Name: TOWN OF AYER IPP SAMPLING**Project Number:** Not Specified**Lab Number:** L2041890**Report Date:** 10/12/20

Method Blank Analysis Batch Quality Control

Analytical Method: 1,8082A
 Analytical Date: 10/09/20 14:50
 Analyst: KB

Extraction Method: EPA 3540C
 Extraction Date: 10/08/20 19:50
 Cleanup Method: EPA 3665A
 Cleanup Date: 10/09/20
 Cleanup Method: EPA 3660B
 Cleanup Date: 10/09/20

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01 Batch: WG1419978-1						
Aroclor 1016	ND		ug/kg	91.7	--	A
Aroclor 1221	ND		ug/kg	91.7	--	A
Aroclor 1232	ND		ug/kg	91.7	--	A
Aroclor 1242	ND		ug/kg	91.7	--	A
Aroclor 1248	ND		ug/kg	91.7	--	A
Aroclor 1254	ND		ug/kg	91.7	--	A
Aroclor 1260	ND		ug/kg	91.7	--	A
Aroclor 1262	ND		ug/kg	91.7	--	A
Aroclor 1268	ND		ug/kg	91.7	--	A
PCBs, Total	ND		ug/kg	91.7	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	77		30-150	B
Decachlorobiphenyl	72		30-150	B
2,4,5,6-Tetrachloro-m-xylene	77		30-150	A
Decachlorobiphenyl	93		30-150	A

Lab Control Sample Analysis**Batch Quality Control****Project Name:** TOWN OF AYER IPP SAMPLING**Lab Number:** L2041890**Project Number:** Not Specified**Report Date:** 10/12/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01 Batch: WG1419978-2 WG1419978-3									
Aroclor 1016	102		95		40-140	7		50	A
Aroclor 1260	113		103		40-140	9		50	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	78		70		30-150	B
Decachlorobiphenyl	73		69		30-150	B
2,4,5,6-Tetrachloro-m-xylene	82		74		30-150	A
Decachlorobiphenyl	96		89		30-150	A

METALS

Project Name: TOWN OF AYER IPP SAMPLING**Lab Number:** L2041890**Project Number:** Not Specified**Report Date:** 10/12/20**SAMPLE RESULTS**

Lab ID: L2041890-01

Date Collected: 10/01/20 13:00

Client ID: SLUDGE GRAB

Date Received: 10/02/20

Sample Location: BROOK STREET, AYER, MA

Field Prep: Not Specified

Sample Depth:

TCLP/SPLP Ext. Date: 10/05/20 22:48

Matrix: Sludge

Percent Solids: 3%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Mansfield Lab											
Aluminum, TCLP	ND		mg/l	1.00	--	1	10/07/20 13:40	10/10/20 00:25	EPA 3015	1,6010D	BV
Arsenic, TCLP	ND		mg/l	1.00	--	1	10/07/20 13:40	10/10/20 00:25	EPA 3015	1,6010D	BV
Beryllium, TCLP	ND		mg/l	0.100	--	1	10/07/20 13:40	10/10/20 00:25	EPA 3015	1,6010D	BV
Cadmium, TCLP	ND		mg/l	0.100	--	1	10/07/20 13:40	10/10/20 00:25	EPA 3015	1,6010D	BV
Chromium, TCLP	ND		mg/l	0.200	--	1	10/07/20 13:40	10/10/20 00:25	EPA 3015	1,6010D	BV
Copper, TCLP	ND		mg/l	0.200	--	1	10/07/20 13:40	10/10/20 00:25	EPA 3015	1,6010D	BV
Lead, TCLP	ND		mg/l	0.500	--	1	10/07/20 13:40	10/10/20 00:25	EPA 3015	1,6010D	BV
Mercury, TCLP	ND		mg/l	0.0010	--	1	10/07/20 13:58	10/07/20 20:33	EPA 7470A	1,7470A	AL
Molybdenum, TCLP	ND		mg/l	0.500	--	1	10/07/20 13:40	10/10/20 00:25	EPA 3015	1,6010D	BV
Nickel, TCLP	ND		mg/l	0.500	--	1	10/07/20 13:40	10/10/20 00:25	EPA 3015	1,6010D	BV
Silver, TCLP	ND		mg/l	0.100	--	1	10/07/20 13:40	10/10/20 00:25	EPA 3015	1,6010D	BV
Zinc, TCLP	ND		mg/l	0.500	--	1	10/07/20 13:40	10/10/20 00:25	EPA 3015	1,6010D	BV



Project Name: TOWN OF AYER IPP SAMPLING
Project Number: Not Specified

Lab Number: L2041890
Report Date: 10/12/20

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Mansfield Lab for sample(s): 01 Batch: WG1419262-1										
Aluminum, TCLP	ND		mg/l	1.00	--	1	10/07/20 13:40	10/09/20 17:20	1,6010D	BV
Arsenic, TCLP	ND		mg/l	1.00	--	1	10/07/20 13:40	10/09/20 17:20	1,6010D	BV
Beryllium, TCLP	ND		mg/l	0.100	--	1	10/07/20 13:40	10/09/20 17:20	1,6010D	BV
Cadmium, TCLP	ND		mg/l	0.100	--	1	10/07/20 13:40	10/09/20 17:20	1,6010D	BV
Chromium, TCLP	ND		mg/l	0.200	--	1	10/07/20 13:40	10/09/20 17:20	1,6010D	BV
Copper, TCLP	ND		mg/l	0.200	--	1	10/07/20 13:40	10/09/20 17:20	1,6010D	BV
Lead, TCLP	ND		mg/l	0.500	--	1	10/07/20 13:40	10/09/20 17:20	1,6010D	BV
Molybdenum, TCLP	ND		mg/l	0.500	--	1	10/07/20 13:40	10/09/20 17:20	1,6010D	BV
Nickel, TCLP	ND		mg/l	0.500	--	1	10/07/20 13:40	10/09/20 17:20	1,6010D	BV
Silver, TCLP	ND		mg/l	0.100	--	1	10/07/20 13:40	10/09/20 17:20	1,6010D	BV
Zinc, TCLP	ND		mg/l	0.500	--	1	10/07/20 13:40	10/09/20 17:20	1,6010D	BV

Prep Information

Digestion Method: EPA 3015
TCLP/SPLP Extraction Date: 10/05/20 06:32

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Mansfield Lab for sample(s): 01 Batch: WG1419265-1										
Mercury, TCLP	ND		mg/l	0.0010	--	1	10/07/20 13:58	10/07/20 20:20	1,7470A	AL

Prep Information

Digestion Method: EPA 7470A
TCLP/SPLP Extraction Date: 10/05/20 06:32

Lab Control Sample Analysis

Batch Quality Control

Project Name: TOWN OF AYER IPP SAMPLING

Project Number: Not Specified

Lab Number: L2041890

Report Date: 10/12/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Mansfield Lab Associated sample(s): 01 Batch: WG1419262-2								
Aluminum, TCLP	94		-		75-125	-		20
Arsenic, TCLP	100		-		75-125	-		20
Beryllium, TCLP	98		-		75-125	-		20
Cadmium, TCLP	102		-		75-125	-		20
Chromium, TCLP	94		-		75-125	-		20
Copper, TCLP	95		-		75-125	-		20
Lead, TCLP	97		-		75-125	-		20
Molybdenum, TCLP	97		-		75-125	-		20
Nickel, TCLP	90		-		75-125	-		20
Silver, TCLP	95		-		75-125	-		20
Zinc, TCLP	102		-		75-125	-		20
TCLP Metals by EPA 1311 - Mansfield Lab Associated sample(s): 01 Batch: WG1419265-2								
Mercury, TCLP	110		-		80-120	-		

Matrix Spike Analysis **Batch Quality Control**

Project Name: TOWN OF AYER IPP SAMPLING
Project Number: Not Specified

Lab Number: L2041890
Report Date: 10/12/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1419262-3 QC Sample: L2042014-01 Client ID: MS Sample												
Aluminum, TCLP	ND	20	18.8	94		-	-		75-125	-		20
Arsenic, TCLP	ND	1.2	1.16	97		-	-		75-125	-		20
Beryllium, TCLP	ND	0.5	0.483	97		-	-		75-125	-		20
Cadmium, TCLP	ND	0.51	0.506	99		-	-		75-125	-		20
Chromium, TCLP	ND	2	1.84	92		-	-		75-125	-		20
Copper, TCLP	ND	2.5	2.32	93		-	-		75-125	-		20
Lead, TCLP	ND	5.1	4.88	96		-	-		75-125	-		20
Molybdenum, TCLP	ND	10	9.33	93		-	-		75-125	-		20
Nickel, TCLP	ND	5	4.41	88		-	-		75-125	-		20
Silver, TCLP	ND	0.5	0.452	90		-	-		75-125	-		20
Zinc, TCLP	1.43	5	6.25	96		-	-		75-125	-		20
TCLP Metals by EPA 1311 - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1419265-3 QC Sample: L2041987-01 Client ID: MS Sample												
Mercury, TCLP	ND	0.025	0.0264	106		-	-		80-120	-		20

Project Name: TOWN OF AYER IPP SAMPLING
Project Number: Not Specified

Lab Duplicate Analysis

Batch Quality Control

Lab Number: L2041890
Report Date: 10/12/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1419262-4 QC Sample: L2042014-01 Client ID: DUP Sample						
Lead, TCLP	ND	ND	mg/l	NC		20
TCLP Metals by EPA 1311 - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1419265-4 QC Sample: L2041987-01 Client ID: DUP Sample						
Mercury, TCLP	ND	ND	mg/l	NC		20

INORGANICS & MISCELLANEOUS

Project Name: TOWN OF AYER IPP SAMPLING**Lab Number:** L2041890**Project Number:** Not Specified**Report Date:** 10/12/20**SAMPLE RESULTS****Lab ID:** L2041890-01**Date Collected:** 10/01/20 13:00**Client ID:** SLUDGE GRAB**Date Received:** 10/02/20**Sample Location:** BROOK STREET, AYER, MA**Field Prep:** Not Specified**Sample Depth:****Matrix:** Sludge

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	3.41		%	0.100	NA	1	-	10/02/20 23:05	121,2540G	TR
Phosphorus, Total	16000		mg/kg	630	--	4.3	-	10/09/20 11:30	121,4500P-E	MV
Chromium, Hexavalent	ND		mg/kg	23.5	--	1	10/08/20 11:50	10/09/20 12:01	1,7196A	DR



Project Name: TOWN OF AYER IPP SAMPLING
Project Number: Not Specified

Lab Number: L2041890
Report Date: 10/12/20

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1419782-1										
Chromium, Hexavalent	ND		mg/kg	0.800	--	1	10/08/20 11:50	10/09/20 12:01	1,7196A	DR
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1420075-1										
Phosphorus, Total	ND		mg/kg	4.5	--	.9	-	10/09/20 11:30	121,4500P-E	MV

Lab Control Sample Analysis**Batch Quality Control****Project Name:** TOWN OF AYER IPP SAMPLING**Project Number:** Not Specified**Lab Number:** L2041890**Report Date:** 10/12/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1419782-2								
Chromium, Hexavalent	93		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1420075-2								
Phosphorus, Total	99		-		52-148	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: TOWN OF AYER IPP SAMPLING
Project Number: Not Specified

Lab Number: L2041890
Report Date: 10/12/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1419782-4 QC Sample: L2041890-01 Client ID: SLUDGE GRAB												
Chromium, Hexavalent	ND	30200	30400	101		-	-		75-125	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1420075-4 QC Sample: L2041890-01 Client ID: SLUDGE GRAB												
Phosphorus, Total	16000	5840	20000	69	Q	-	-		75-125	-		20

Project Name: TOWN OF AYER IPP SAMPLING
Project Number: Not Specified

Lab Duplicate Analysis
Batch Quality Control

Lab Number: L2041890
Report Date: 10/12/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1417568-1 QC Sample: L2041766-01 Client ID: DUP Sample						
Solids, Total	85.7	84.6	%	1		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1419782-6 QC Sample: L2041890-01 Client ID: SLUDGE GRAB						
Chromium, Hexavalent	ND	ND	mg/kg	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1420075-3 QC Sample: L2041890-01 Client ID: SLUDGE GRAB						
Phosphorus, Total	16000	20000	mg/kg	22	Q	20

Project Name: TOWN OF AYER IPP SAMPLING**Lab Number:** L2041890**Project Number:** Not Specified**Report Date:** 10/12/20**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information**Cooler** **Custody Seal**

A Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2041890-01A	Plastic 2oz unpreserved for TS	A	NA		5.9	Y	Absent		TS(7)
L2041890-01B	Glass 60mL/2oz unpreserved	A	NA		5.9	Y	Absent		TPHOS-4500(28),PCB-8082-3540C(14)
L2041890-01C	Glass 120ml/4oz unpreserved	A	NA		5.9	Y	Absent		HEXCR-7196(30)
L2041890-01D	Glass 250ml/8oz unpreserved	A	NA		5.9	Y	Absent		TPHOS-4500(28),PCB-8082-3540C(14)
L2041890-01X	Plastic 120ml HNO3 preserved Extracts	A	NA		5.9	Y	Absent		BE-CI(180),CD-CI(180),NI-CI(180),AS-CI(180),AL-CI(180),HG-C(28),CU-CI(180),PB-CI(180),ZN-CI(180),CR-CI(180),MO-CI(180),AG-CI(180)
L2041890-01X9	Tumble Vessel	A	NA		5.9	Y	Absent		-

Project Name: TOWN OF AYER IPP SAMPLING**Lab Number:** L2041890**Project Number:** Not Specified**Report Date:** 10/12/20

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name: TOWN OF AYER IPP SAMPLING**Lab Number:** L2041890**Project Number:** Not Specified**Report Date:** 10/12/20**Footnotes**

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.

Report Format: Data Usability Report



Project Name: TOWN OF AYER IPP SAMPLING**Lab Number:** L2041890**Project Number:** Not Specified**Report Date:** 10/12/20**Data Qualifiers**

- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: TOWN OF AYER IPP SAMPLING
Project Number: Not Specified

Lab Number: L2041890
Report Date: 10/12/20

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Alpha Analytical, Inc.

ID No.:17873

Facility: **Company-wide**

Revision 17

Department: **Quality Assurance**

Published Date: 4/28/2020 9:42:21 AM

Title: **Certificate/Approval Program Summary**

Page 1 of 1

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility**EPA 624/624.1:** m/p-xylene, o-xylene, Naphthalene**EPA 8260C:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.**EPA 8270D:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.**SM4500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.**Mansfield Facility****SM 2540D:** TSS**EPA 8082A:** NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

EPA TO-12 Non-methane organics**EPA 3C** Fixed gases**Biological Tissue Matrix:** EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:**Drinking Water****EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,****EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B****EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.**Microbiology:** **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.****Non-Potable Water****SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:**Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,****SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.**EPA 624.1:** Volatile Halocarbons & Aromatics,**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.****Mansfield Facility:****Drinking Water****EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.**EPA 522.****Non-Potable Water****EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.**EPA 245.1** Hg.**SM2340B**

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

Chain of Custody Record

Alpha Analytical Labs
(508) 898-9220

L209189

Sample Type

5. Surface Water

6. Storm Water

7. Other

4. Drinking Water

Hoyle Tanner

Dr. Hoyle Tanner

5555-Q#

Q#01409 PO#27573

Fax #: (603) 669-4168

☐ Rush _____ Day TurnaroundPage 28 of 28

APPENDIX E

TOXICOLOGY REPORTS



Leaders in Environmental Toxicology & Chemistry

October 5, 2020

Ms. Paula Boyle
Hoyle, Tanner and Associates Inc.
150 Dow Street
Manchester, New Hampshire 03101

Dear Ms. Boyle:

Enclosed, please find a copy of our report evaluating results of toxicity tests completed on effluent samples collected from the Ayer, Massachusetts Wastewater Treatment Facility in September 2020. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

Please do not hesitate to call me should you have any questions regarding the report.

Sincerely,

Enthalpy Analytical, LLC

A handwritten signature in black ink that reads 'Meredith Wheeler'.

Meredith Wheeler
Project Manager

Enclosure
WET Test Report Certification
Report 34500-20-09
Email Only

Cc: Rick Hudson

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION

Permittee Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on:

Authorized Signature

Print or Type Name

Town of Ayer Board of Selectmen
Print or Type the Permittee's Name

MA0100013
Type or Print the NPDES Permit No.

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION (Bioassay Laboratory)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: October 5, 2020



Kirk Cram
Laboratory Director - Enthalpy Analytical, LLC



**TOXICOLOGICAL EVALUATION
OF A TREATED MUNICIPAL EFFLUENT
BIOMONITORING SUPPORT FOR A NPDES PERMIT:
September 2020**

Ayer Wastewater Treatment Facility
Ayer, Massachusetts
NPDES Permit Number MA0100013

Prepared For:

Hoyle, Tanner and Associates Inc.
150 Dow Street
Manchester, New Hampshire 03101

Prepared By:

Enthalpy Analytical, LLC
One Lafayette Road
Hampton, New Hampshire 03842

September 2020
Reference Number: Ayer34500-20-09

STUDY NUMBER 34500

EXECUTIVE SUMMARY

The following summarizes the results of acute and chronic exposure bioassays performed during September 2020 using samples collected from the Ayer, Massachusetts Wastewater Treatment Facility. Samples were provided by Civil and Environmental Consultants, Inc., Raynham, Massachusetts. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

C. dubia, cultured at Enthalpy, were <24 hours old juveniles. Dilution water was receiving water collected from the Nashua River upstream of the discharge. Samples were received under chain of custody in good order. All sample receipt, test conditions and control endpoints were within protocol specifications, except where otherwise noted.

The results presented in this report relate only to the samples described on the chain(s) of custody and sample receipt log(s), and are to be used only by the submitter. Results from the chronic and modified acute exposure assays and their relationship to permit limits are summarized in the following matrix.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Effluent Meets Permit Limit	Assay Meets Protocol Limits
<i>Ceriodaphnia dubia</i>	48 Hours	>100%	NC	≥100%	Yes	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	IC-25	Permit Limit (C-NOEC)	Effluent Meets Permit Limit	Assay Meets Protocol Limits
<i>Ceriodaphnia dubia</i> ^a	7 Days	100%	NC	≥7.7%	Yes	Yes

COMMENTS:

NC = Not Calculated.

^a Replicate F of the 25% and 50% test concentrations were removed from reproduction statistical analyses and brood production calculations, but retained for the statistical analysis for survival as the test organism was determined to be male.

**TOXICOLOGICAL EVALUATION
OF A TREATED MUNICIPAL EFFLUENT
BIOMONITORING SUPPORT FOR A NPDES PERMIT:
September 2020**

Ayer Wastewater Treatment Facility
Ayer, Massachusetts
NPDES Permit Number MA0100013

1.0 INTRODUCTION

This report presents the results of toxicity tests completed on a series of composite effluent samples collected from the Ayer, Massachusetts Wastewater Treatment Facility (Ayer WWTF). Samples were provided by Civil and Environmental Consultants, Inc., Raynham, Massachusetts. Testing was based on programs and protocols developed by the US EPA (2002), with exceptions as noted by US EPA Region I (2011, 2013), and involved conducting acute and chronic toxicity tests with the daphnid, *Ceriodaphnia dubia*. Testing was conducted at Enthalpy Analytical, LLC (Enthalpy), Hampton, New Hampshire in accordance with the provisions of TNI Standards (2009).

Acute toxicity tests involve preparing a series of test concentrations by diluting effluent with control water. Groups of test organisms are exposed to each test concentration and control for a specified period. The mortality data for each concentration can be used to calculate the median lethal concentration or LC-50, defined as the concentration of effluent that kills half of the test organisms. Samples with a high LC-50 value are less likely to cause significant environmental impacts. These data can also be analyzed to determine the no effect level. This Acute No Observed Effect Concentration (A-NOEC) is defined as the highest tested effluent concentration that causes no significant mortality. Chronic toxicity tests measure sublethal effects, exposing test organisms to samples during a sensitive period in the life cycle. Daphnid chronic tests measure survival and juvenile production. Using Analysis of Variance techniques to evaluate the data, it is possible to determine the lowest tested concentration that had an effect (C-LOEC) and the highest tested concentration where no effect (C-NOEC) was observed. An Inhibition Concentration (IC) may be calculated by linear interpolation to confirm the C-NOEC in situations where a non-standard dose-response or sample toxicity are encountered. The IC-25 is calculated to best approximate the C-NOEC (US EPA 2000).

2.0 MATERIALS AND METHODS

2.1 General Methods

Toxicological and analytical protocols used in this program follow procedures primarily designed to provide standard approaches for the evaluation of toxicological effects of discharges on aquatic organisms (US EPA 2002), and for the analysis of water samples (APHA 2012). See Section 4.0 for a list of references.

2.2 Test Species

C. dubia were maintained in laboratory water at 25±1°C with a photoperiod of 16:8 hours light:dark. Cultures are fed daily with a yeast/trout chow/Cerophyll or alfalfa leaves (YTC) mixture supplemented with *Pseudokirchneriella subcapitata* (algae) (US EPA 2002). Adults on a brood board were isolated 24 hours prior to test start. Daphnids used in the chronic assay were allowed to reproduce for 8 hours.

2.3 Effluent, Receiving Water, and Laboratory Water

Effluent and receiving water collection information is provided in Table 1. Samples were received at 0-6°C as per 40 CFR §136.3 unless otherwise noted, stored at 4±2°C and warmed to 25±1°C prior to preparing test solutions. Laboratory water was synthetic reconstituted water prepared at Enthalpy according to protocol (US EPA 2002). This water has been used to successfully culture freshwater organisms since 1992.

Total residual chlorine (TRC) was measured by amperometric titration (MDL 0.02 mg/L) in the effluent samples prior to use in the assays. Samples with ≥ 0.02 mg/L TRC were dechlorinated using sodium thiosulfate (US EPA 2002) and a control treatment using laboratory water adjusted with the same amount of sodium thiosulfate used to dechlorinate the effluent was run concurrently with the assay. If sample pH measured < 6.0 SU or > 9.0 SU, samples were adjusted using sodium hydroxide or hydrochloric acid, respectively, and a control treatment using laboratory water adjusted with the same amount of either compound used to modify sample pH was run concurrently with the assay. When applicable, data from sodium thiosulfate and/or pH adjusted laboratory control treatments can be found in Appendix A.

2.4 Acute Exposure Bioassay

The 48-hour static acute assay was conducted at $25 \pm 1^\circ\text{C}$ with a photoperiod of 16:8 hours light:dark. Test concentrations were 100% (undiluted), 50%, 25%, 12.5%, and 6.25% effluent. Daphnids were maintained in 30 mL test chambers with approximately 20 mL of test solution in each of 4 replicates with 5 organisms/replicate. Test organisms were derived from a pool of mixed organisms recovered from Enthalpy's culture the morning of testing. All organisms used were recovered from the same type of culture water.

Survival in all test replicates was recorded daily. A fifth replicate was included as a surrogate test chamber to obtain daily water qualities without disturbing the test animals, and was treated the same as actual test chambers with the addition of animals and food, but was not used to determine endpoint data. Dissolved oxygen, pH and temperature were measured daily, and specific conductivity was measured at the start of the assay.

2.5 Chronic Exposure Bioassay

The chronic exposure bioassay was conducted according to protocol (US EPA 2002), which called for the daily renewal of test solutions. Test treatments for the assay were 100% (undiluted), 50%, 25%, 12.5%, 7.7%, and 6.25% effluent. Dissolved oxygen, pH, specific conductivity and temperature were measured in one replicate of each new and old test solution.

Test chambers for the daphnid assay were 30 mL portion cups containing approximately 20 mL of test solution in each of 11 replicates with 1 organism/replicate. Replicates were not randomized during testing; rather, organisms were added at test initiation by blocking by known parentage. Survival and juvenile production were monitored daily. Daphnids were each fed 200 μL of a mixture of YTC and algae after daily renewals.

2.6 Data Analysis

Statistical analysis of acute and chronic exposure data was completed using CETIS™ v1.9.6.3, Comprehensive Environmental Toxicity Information System, software. The program computes acute and chronic exposure endpoints based on US EPA decision tree guidelines specified in individual test methods. If survival in the highest test concentration is $> 50\%$, the LC-50 is obtained by direct observation of the raw data. As needed, the A-NOEC is determined as the highest test concentration that caused no significant mortality. For chronic exposure endpoints statistical significance was accepted at $\alpha = 0.05$. For statistical calculations of *C. dubia* juvenile production, data from only the first three broods are used.

2.7 Quality Control

As part of the laboratory quality control program, reference toxicant evaluations are completed on a regular basis for each test species. These results provide regular laboratory performance evaluation through the comparison of historic data sets. See Table 2 for details.

3.0 RESULTS AND DISCUSSION

Results of the acute exposure assay completed using *C. dubia* are presented in Table 3, and chronic results can be found in Table 4. Water quality data collected during the assays are summarized in Table 5. US EPA Region I Attachment F toxicity test summary sheets are provided after the tables. Support data, including copies of laboratory bench sheets, are provided in Appendix A.

3.1 Acute Exposure Bioassay

Minimum test acceptability criteria require $\geq 90\%$ survival in the control concentrations. Achievement of these results indicates that healthy test organisms were used and that the dilution water had no significant adverse impact on the outcome of the assay. See the Executive Summary and Table 3 for test acceptability.

3.2 Chronic Exposure Bioassay

Minimum test acceptability criteria require 80% control survival, mean reproduction of 15 juveniles/female, production of 3 broods by at least 60% of control females, and the MSDp for reproduction to be 13-47% for *Ceriodaphnia dubia* (US EPA 2002). Achievement of these results indicates that healthy test organisms were used and that the dilution water had no significant adverse impact on the outcome of the assay. See the Executive Summary and Table 4 for test acceptability.

4.0 LITERATURE CITED

- 40 CFR §136.3. *Code of Federal Regulations* (CFR), Protection of the Environment (Title 40), Guidelines Establishing Test Procedures for the Analysis of Pollutants (Part 136), Identification of Test Procedures (sub-part 3), Table II-Required Containers, Preservation Techniques, and Holding Times.
- APHA. 2012. *Standard Methods for the Examination of Water and Wastewater*, 22nd Edition. Washington D.C.
- The NELAC Institute (TNI). 2009. *Environmental Laboratory Sector, Volume 1: Management and Technical Requirements for Laboratories Performing Environmental Analysis (TNI Standard)*. EL-V1-2009.
- US EPA. 2000. *Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing (40 CFR Part 136)*. EPA 821-B-00-004.
- US EPA. 2002. *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms*. Fifth Edition. EPA-821-R-02-012.
- US EPA. 2002. *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*. Fourth Edition. EPA-821-R-02-013.
- US EPA Region I. 2011. *US EPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol*. US EPA Region I Office, Boston, Massachusetts. February 28, 2011.
- US EPA Region I. 2013. *Freshwater Chronic Toxicity Test Procedure and Protocol - US EPA Region I*. US EPA Region I Office, Boston, Massachusetts. December 2013.

**TABLE 1. Sample Collection Information. Evaluation. September 2020.
Ayer WWTF Effluent Evaluation. September 2020.**

Sample Description	Type	Collection		Receipt		Receipt Temp °C
		Date	Time	Date	Time	
EFFLUENT						
Start	Comp	09/15-16/20	0645-0615	09/16/20	0715	9 ^a
First Renewal	Comp	09/17-18/20	0700-0630	09/18/20	0700	16 ^a
Second Renewal	Comp	09/20-21/20	0700-0630	09/21/20	0700	2
RECEIVING WATER						
Start	Grab	09/16/20	0705	09/16/20	0715	9 ^a
First Renewal	Grab	09/18/20	0620	09/18/20	0700	16 ^a
Second Renewal	Grab	09/21/20	0640	09/21/20	0700	2

COMMENTS:

^a Upon receipt, the temperature was outside of the range of 0-6°C per 40 CFR §136.3 for NPDES effluent samples and support chemistry samples. Samples were received with ice in the cooler, and were picked up and hand delivered by Enthalpy's courier the day sampling was completed.

**TABLE 2. *C. dubia* Reference Toxicant Data.
Ayer WWTF Effluent Evaluation. September 2020.**

Date	Organism Lot	Endpoint	Value	Historic Mean/ Tendency	Acceptable Range	Reference Toxicant
<i>C. dubia</i>						
08/27/20	00CdEAH082720	Survival: LC-50	41.8	29.7	11.5 – 47.8	SDS (mg/L)
09/01/20	00CdEAH090120	Survival: C-NOEC	30.0	30.0	15.0 – 60.0	Copper (µg/L)
09/01/20	00CdEAH090120	Reproduction: C-NOEC	30.0	15.0	7.5 – 30.0	Copper (µg/L)
09/01/20	00CdEAH090120	Reproduction: MSDp	43.4	29.7	11.6 – 47.8	Copper (µg/L)

Means and Acceptable Ranges based on the 20 most recent reference toxicant assays.

**TABLE 3. *C. dubia* Acute Exposure Assay Data Summary.
Ayer WWTF Effluent Evaluation. September 2020.**

Species	Exposure	Percent Survival						
		LAB	RW	6.25%	12.5%	25%	50%	100%
<i>C. dubia</i>	48 Hours	100%	100%	100%	100%	100%	100%	100%

Species	Exposure	LC-50 and A-NOEC Results			
		Spearman-Kärber	Linear Interpolation	Direct Observation	A-NOEC
<i>C. dubia</i>	48 Hours	NC	NC	>100%	NC

COMMENTS:

NC = Not Calculated.

RW = Receiving Water; used as the diluent.

**TABLE 4. *C. dubia* Chronic Exposure Assay Data Summary.
Ayer WWTF Effluent Evaluation. September 2020.**

Effluent Conc.	Mean Percent Survival	Mean Reproduction	% Females Producing 3 Broods	Is There a Significant Difference Based on	
	Day 7	(Juv/Female)		Survival (%)	Reproduction
LAB	100%	32.4	100%	-	-
RW	100%	32.6	90%	-	-
6.25%	100%	30.6	90%	No	No
7.7%	100%	31.3	70%	No	No
12.5%	100%	31.2	100%	No	No
25% ^a	90%	23.2	62.5%	No	No
50% ^a	90%	27.2	87.5%	No	No
100%	100%	29.3	90%	No	No

MSDp = 28.5%

NOEC = 100%

NOEC = 100%

COMMENTS:

RW = Receiving Water; used as the diluent.

^a Replicate F of the 25% and 50% test concentrations were removed from reproduction statistical analyses and brood production calculations, but retained for the statistical analysis for survival as the test organism was determined to be male.

**TABLE 5. WET Support Chemistry Data.
Ayer WWTF Effluent Evaluation. September 2020.**

PARAMETER	UNITS	EFFLUENT	RECEIVING WATER
Specific Conductivity	µmhos/cm	1434	488
pH	SU	7.94	7.14
Total Residual Chlorine	mg/L	<0.02	-
Alkalinity	mg/L	270	45
Hardness	mg/L	230	63
Total Solids	mg/L	880	-
Total Dissolved Solids	mg/L	940	-
Ammonia	mg/L as N	<0.1	<0.1
Total Organic Carbon	mg/L	6.8	4.3
Aluminum, total	mg/L	0.086	0.027
Cadmium, total	mg/L	<0.0003	<0.0003
Calcium, total	mg/L	68.7	18.6
Copper, total	mg/L	0.0021	0.0039
Lead, total	mg/L	<0.0003	0.001
Magnesium, total	mg/L	12.4	3.54
Nickel, total	mg/L	0.0035	0.002
Zinc, total	mg/L	0.015	0.0074

COMMENTS:

Additional water quality and analytical support data are provided in Appendix A.

TOXICITY TEST SUMMARY SHEET

FACILITY NAME:	Ayer WWTF	TEST START DATE:	09/17/20
NPDES PERMIT NO.:	MA0100013	TEST END DATE:	09/19/20

TEST TYPE	TEST SPECIES	SAMPLE TYPE	SAMPLE METHOD
<input checked="" type="checkbox"/> Acute	<input type="checkbox"/> <i>Pimephales promelas</i>	<input type="checkbox"/> Prechlorinated	<input type="checkbox"/> Grab
<input type="checkbox"/> Chronic	<input checked="" type="checkbox"/> <i>Ceriodaphnia dubia</i>	<input type="checkbox"/> Dechlorinated	<input checked="" type="checkbox"/> Composite
<input type="checkbox"/> Modified Chronic (Reporting Acute Values)	<input type="checkbox"/> <i>Daphnia pulex</i>	<input type="checkbox"/> Chlorine Spiked in Lab	<input type="checkbox"/> Flow-thru
<input type="checkbox"/> 24 Hour Screen	<input type="checkbox"/> <i>Americamysis bahia</i>	<input type="checkbox"/> Chlorinated on Site	<input type="checkbox"/> Other
	<input type="checkbox"/> <i>Cyprinodon variegatus</i>	<input type="checkbox"/> Unchlorinated	
	<input type="checkbox"/> <i>Menidia beryllina</i>	<input checked="" type="checkbox"/> No Detectable Chlorine Upon Receipt	
	<input type="checkbox"/> <i>Arbacia punctulata</i>		

DILUTION WATER:

☒ Receiving water collected at a point upstream or away from the discharge, free from toxicity or other sources of contamination; Receiving Water Name: Nashua River

☐ Alternate surface water of known quality and hardness, to generally reflect the characteristics of the receiving water; Receiving Water Name: _____

☐ Synthetic water prepared using either Millipore Milli-Q or equivalent deionized water and reagent grade chemicals; or deionized water combined with mineral water.

☐ Artificial sea salts mixed with deionized water

☐ Deionized water and hypersaline brine

☐ Other _____

EFFLUENT SAMPLING DATES: 09/15-16/20

EFFLUENT CONCENTRATIONS TESTED (%): 100, 50, 25, 12.5, 6.25

Permit Limit Concentration: ≥100% %

Was the effluent salinity adjusted? No If yes, to what level? - ppt

REFERENCE TOXICANT TEST DATE: 08/27/20 LC-50: 41.8 mg/L Sodium Dodecyl Sulfate

PERMIT LIMITS AND TEST RESULTS

Test Acceptability Criteria

Mean Diluent Control Survival: 100 %

LIMITS

LC-50: 100 %

A-NOEC: - %

RESULTS

LC-50 >100 %

Upper Limit: - %

Lower Limit: - %

Method: Direct Observation

A-NOEC - %

TOXICITY TEST SUMMARY SHEET

FACILITY NAME:	<u>Ayer WWTF</u>	TEST START DATE:	<u>09/17/20</u>
NPDES PERMIT NO.:	<u>MA0100013</u>	TEST END DATE:	<u>09/24/20</u>

TEST TYPE	TEST SPECIES	SAMPLE TYPE	SAMPLE METHOD
<input type="checkbox"/> Acute	<input type="checkbox"/> <i>Pimephales promelas</i>	<input type="checkbox"/> Prechlorinated	<input type="checkbox"/> Grab
<input checked="" type="checkbox"/> Chronic	<input checked="" type="checkbox"/> <i>Ceriodaphnia dubia</i>	<input type="checkbox"/> Dechlorinated	<input checked="" type="checkbox"/> Composite
<input type="checkbox"/> Modified Chronic (Reporting Acute Values)	<input type="checkbox"/> <i>Daphnia pulex</i>	<input type="checkbox"/> Chlorine Spiked in Lab	<input type="checkbox"/> Flow-thru
<input type="checkbox"/> 24 Hour Screen	<input type="checkbox"/> <i>Americamysis bahia</i>	<input type="checkbox"/> Chlorinated on Site	<input type="checkbox"/> Other
	<input type="checkbox"/> <i>Cyprinodon variegatus</i>	<input type="checkbox"/> Unchlorinated	
	<input type="checkbox"/> <i>Menidia beryllina</i>	<input checked="" type="checkbox"/> No Detectable Chlorine Upon Receipt	
	<input type="checkbox"/> <i>Arbacia punctulata</i>		

DILUTION WATER:

☒ Receiving water collected at a point upstream or away from the discharge, free from toxicity or other sources of contamination; Receiving Water Name: Nashua River

☐ Alternate surface water of known quality and hardness, to generally reflect the characteristics of the receiving water; Receiving Water Name: _____

☐ Synthetic water prepared using either Millipore Milli-Q or equivalent deionized water and reagent grade chemicals; or deionized water combined with mineral water.

☐ Artificial sea salts mixed with deionized water

☐ Deionized water and hypersaline brine

☐ Other _____

EFFLUENT SAMPLING DATES: 09/15-16/20 09/17-18/20 09/20-21/20

EFFLUENT CONCENTRATIONS TESTED (%): 100, 50, 25, 12.5, 7.7, 6.25

Permit Limit Concentration: ≥7.7 %

Was the effluent salinity adjusted? No If yes, to what level? - ppt

REFERENCE TOXICANT TEST DATE: 09/01/20 NOEC: 30.0 µg/L Copper

PERMIT LIMITS AND TEST RESULTS

Test Acceptability Criteria

Mean Diluent Control Survival: <u>100</u> %	Mean # Juveniles/Female: <u>32.6</u>
	MSDp <u>28.5</u> %

LIMITS

C-NOEC: ≥7.7 %

IC - - %

RESULTS

C – NOEC: 100 %

C – LOEC: >100 %

IC - - %

APPENDIX A
DATA SHEETS
STATISTICAL SUPPORT

Contents	Number of Pages
Methods Used in NPDES Permit Biomonitoring Testing	1
Massachusetts DEP Accreditation Certification and Certified Parameter List	2
<u>Acute Exposure Bioassay</u>	
<i>C. dubia</i> Acute Bioassay Bench Sheet	1
<i>C. dubia</i> Acute Reference Toxicant Analysis	1
<u>Chronic Exposure Bioassay</u>	
<i>C. dubia</i> Chronic Reproduction Assay Bench Sheets	2
<i>C. dubia</i> Reference Toxicant Analysis	3
<i>C. dubia</i> Survival and Reproduction Statistical Analysis	6
<i>C. dubia</i> Blocking by Parentage Tracking Sheet	1
Water Quality Bench Sheets	2
Preparation of Dilutions and Record of Meters Used	4
Analytical Chemistry Support Data Summary Report	2
Sample Receipt Record	1
Chain of Custody	4
Assay Review Checklist	1
Total Appendix Pages	31

METHODS USED IN NPDES PERMIT BIOMONITORING TESTING

Parameter	Method
Acute Exposure Bioassays:	
<i>Ceriodaphnia dubia</i>	EPA-821-R-02-012 2002.0
<i>Daphnia pulex</i>	EPA-821-R-02-012 2021.0
<i>Pimephales promelas</i>	EPA-821-R-02-012 2000.0
<i>Americamysis bahia</i>	EPA-821-R-02-012 2007.0
<i>Menidia beryllina</i>	EPA-821-R-02-012 2006.0
<i>Cyprinodon variegatus</i>	EPA-821-R-02-012 2004.0
Chronic Exposure Bioassays:	
<i>Ceriodaphnia dubia</i>	EPA-821-R-02-013 1002.0
<i>Pimephales promelas</i>	EPA-821-R-02-013 1000.0
<i>Cyprinodon variegatus</i>	EPA-821-R-02-014 1004.0
<i>Menidia beryllina</i>	EPA-821-R-02-014 1006.0
<i>Arbacia punctulata</i>	EPA-821-R-02-014 1008.0
<i>Champia parvula</i>	EPA-821-R-02-014 1009.0
Trace Metals:	
Trace Metals	EPA 200.8/SW 6020, EPA 245.7
Hardness	EPA SW846 3rd Ed. 6010
Wet Chemistries:	
Alkalinity	EPA 310.2
Chlorine, Residual	Standard Methods 22 nd Edition - Method 4500-Cl D
Total Organic Carbon	Standard Methods 22 nd Edition - Method 5310 C
Specific Conductance	Standard Methods 22 nd Edition - Method 2510 B
Nitrogen - Ammonia	Standard Methods 22 nd Edition - Method 4500-NH ₃ G
pH	Standard Methods 22 nd Edition - Method 4500-H+ B
Solids, Total (TS)	Standard Methods 22 nd Edition - Method 2540 B
Solids, Total Dissolved (TDS)	Standard Methods 22 nd Edition - Method 2540 C
Solids, Total Suspended (TSS)	Standard Methods 22 nd Edition - Method 2540 D
Dissolved Oxygen	Standard Methods 22 nd Edition - Method 4500-O G

Please visit our web site at www.enthalpy.com/accreditations for a copy of our accreditations and state certifications.

The Commonwealth of Massachusetts



Department of Environmental Protection

Division of Environmental Laboratory Sciences

Senator William X. Wall Experiment Station

certifies

M-NH906

ENTHALPY ANALYTICAL, LLC
1 LAFAYETTE RD
UNIT 6
HAMPTON, NH 03842-0000

Laboratory Director: JASON HOBBS

for the analysis of NON POTABLE WATER (CHEMISTRY)

pursuant to 310 CMR 42.00

This certificate supersedes all previous Massachusetts certificates issued to this laboratory. The laboratory is regulated by and shall be responsible for being in compliance with Massachusetts regulations at 310 CMR 42.00.

This certificate is valid only when accompanied by the latest dated Certified Parameter List as issued by the Massachusetts D.E.P. Contact the Division of Environmental Laboratory Sciences to verify the current certification status of the laboratory.

Certification is no guarantee of the validity of the data. This certification is subject to unannounced laboratory inspections.

A handwritten signature in black ink, reading "Oscar C. Parcells".

Director, Division of Environmental Laboratory Sciences

Issued: 01 JUL 2020

Expires: 30 JUN 2021

**COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

Certified Parameter List as of: 01 JUL 2020

**M-NH906 ENTHALPY ANALYTICAL, LLC
HAMPTON NH**

NON POTABLE WATER (CHEMISTRY)	Effective Date	01 JUL 2020	Expiration Date	30 JUN 2021
<u>Analytes</u>			<u>Methods</u>	
ALUMINUM			EPA 200.8	
ANTIMONY			EPA 200.8	
ARSENIC			EPA 200.8	
BERYLLIUM			EPA 200.8	
CADMIUM			EPA 200.8	
CHROMIUM			EPA 200.8	
COBALT			EPA 200.8	
COPPER			EPA 200.8	
IRON			EPA 200.8	
LEAD			EPA 200.8	
MANGANESE			EPA 200.8	
MERCURY			EPA 245.7	
MOLYBDENUM			EPA 200.8	
NICKEL			EPA 200.8	
SELENIUM			EPA 200.8	
SILVER			EPA 200.8	
THALLIUM			EPA 200.8	
VANADIUM			EPA 200.8	
ZINC			EPA 200.8	
PH			SM 4500-H-B	
SPECIFIC CONDUCTIVITY			SM 2510B	
TOTAL DISSOLVED SOLIDS			SM 2540C	
ALKALINITY, TOTAL			EPA 310.2	
AMMONIA-N			SM 4500-NH3-B, G	
NITRATE-N			SM 4500-NO3-F	
ORTHOPHOSPHATE			SM 4500-P-E	
PHOSPHORUS, TOTAL			SM 4500-P-B,E	
BIOCHEMICAL OXYGEN DEMAND			SM 5210B	
NON-FILTERABLE RESIDUE			SM 2540D	
OIL AND GREASE			EPA 1664	

June 1, 2020

*= Provisional Certification

Page 1 of 1

DAPHNID ACUTE DEFINITIVE ASSAY

STUDY: 34500

CLIENT: Ayer

SAMPLE: Effluent

DILUENT: Receiving Water

SPECIES: *C. dubia*

LOT ID: 00CDEAH091720

AGE: <24 Hours

Treatment	Rep	SURVIVAL			DO (mg/L)			pH (SU)			Temp (°C)			S/C (µmhos/cm)	Sample Chemistries	
		0	24	48	0	24	48	0	24	48	0	24	48	0		
MSR	Surr.	5	5	5	8.6	9.0	9.1	7.96	8.05	8.99	23	22	19	209	T. Metals:	MS2
	A	5	5	5											TOC:	003
	B	5	5	5											Alk.:	004
	C	5	5	5											Hard.:	005
	D	5	5	5											NH3:	006
Receiving Water	Surr.	5	5	5	9.1	9.2	9.0	7.22	8.04	8.02	23	22	19	486	TS/TDS:	007
	A	5	5	5											Batch Used	
	B	5	5	5												
	C	5	5	5											Selenastrum :	
	D	5	5	5											A-6036	
6.25%	Surr.	5	5	5	9.0	9.2	9.1	7.35	8.14	8.15	23	22	19	546	YCT: F143	
	A	5	5	5												
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
12.5%	Surr.	5	5	5	9.0	9.3	9.2	7.49	8.29	8.29	23	22	19	625		
	A	5	5	5												
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
25%	Surr.	5	5	5	9.1	9.4	9.1	7.63	8.39	8.45	23	22	19	726		
	A	5	5	5												
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
50%	Surr.	5	5	5	9.1	9.3	9.1	7.87	8.54	8.61	23	22	19	965		
	A	5	5	5												
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
100%	Surr.	5	5	5	9.5	9.2	9.1	8.02	8.74	8.81	23	22	19	1426		
	A	5	5	5												
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
INC TEMP (°C)		25	25	25												
DATE		09/17/20	09/18	09/18/20	09/17/20	09/18	09/18/20									
TIME		1300	1455	1435	1200	1435	1455									
INITIALS		CC	CFS	PF	CC	CFS	CC									

STANDARD REFERENCE TOXICANT ANALYSIS

Exposure: Acute - 48 Hours

Species: *Ceriodaphnia dubia*

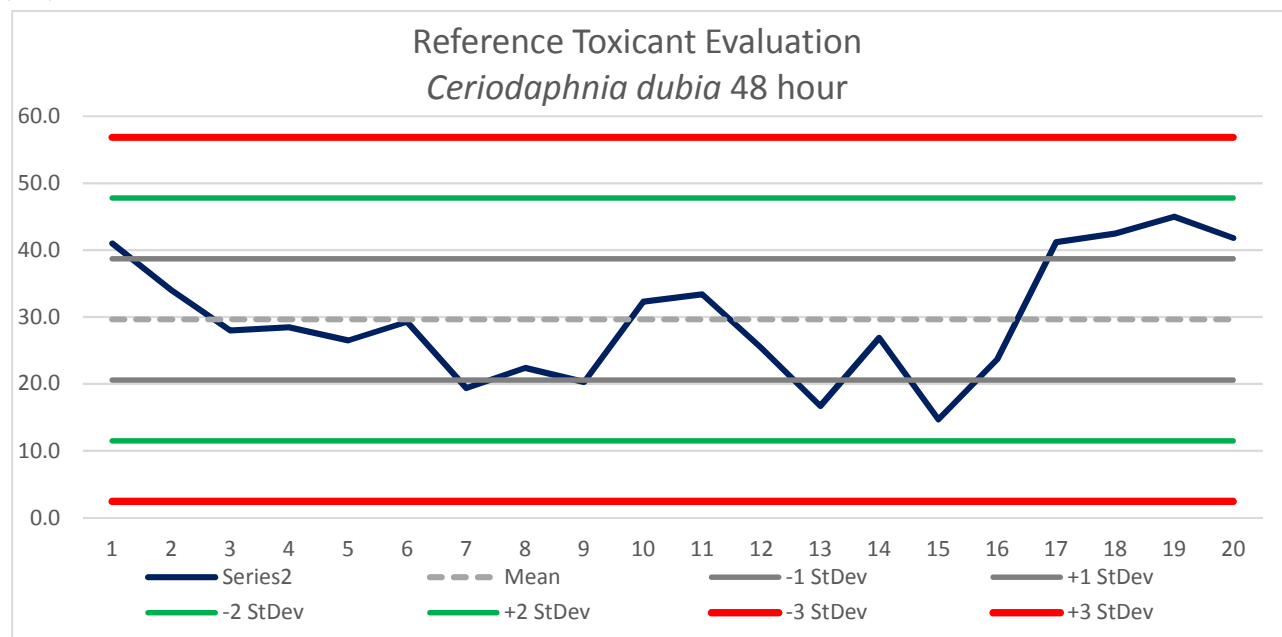
Toxicant: SDS

Temperature: 25C

Long Term Mean: 29.7 mg/L SDS

Long Term CV: 0.3

Date		LC-50	Mean	Std	2 Std	CV	Mean	Mean	Mean	Mean	Mean	Mean
				Dev	Dev		-1 Std	+1 Std	-2 Std	+2 Std	-3 Std	+3 Std
2/19/2019	1	41.0	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85
3/19/2019		34.0	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85
4/23/2019		28.0	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85
4/30/2019		28.5	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85
6/4/2019	5	26.5	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85
6/26/2019		29.3	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85
7/25/2019		19.4	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85
8/1/2019		22.4	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85
9/5/2019		20.3	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85
10/1/2019	10	32.3	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85
11/21/2019		33.4	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85
12/3/2019		25.4	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85
1/23/2020		16.7	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85
2/20/2020		26.9	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85
3/25/2020	15	14.7	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85
4/22/2020		23.7	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85
5/27/2020		41.2	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85
6/2/2020		42.5	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85
7/28/2020		45.0	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85
8/27/2020	20	41.8	29.65	9.07	18.13	30.58	20.58	38.72	11.52	47.78	2.45	56.85



Issued by:

Reviewed by:

Ayer Massachusetts WWTF Effluent Evaluation, September 2020.
Study Numbers 34500.

Data Appendix Page 5

Ceriodaphnia dubia CHRONIC REPRODUCTION ASSAY (page 1 of 2)

STUDY	Sample	DAY	A	B	C	D	E	F	G	H	I	J	Sum	Surv.
34500	MSR	0	+	+	+	+	+	+	+	+	+	+	0	10
CLIENT: Ayer WWTF		1	+	+	+	+	+	+	+	+	+	+	0	10
		2	+	+	+	+	+	+	+	+	+	+	0	10
		3	+	+	+	+	+	+	+	5	+	+	5	10
		4	6	5	5	6	6	5	5	+	5	6	49	10
SAMPLE: Effluent		5	+	+	8	+	14	7	9	9	11	12	70	10
		6	9	10	+	13	+	+	+	15	+	+	47	10
DILUENT: RW		7	12'	15'	15'	19'	21'	18'	15	+	16'	22'	153	10
		8												
Cerio Data Source: MSR <input type="checkbox"/> MHR <input checked="" type="checkbox"/>		Total	27	30	28	38	41	30	29	29	32	40	324	10
RW	0	+	+	+	+	+	+	+	+	+	+	+	0	10
	1	+	+	+	+	+	+	+	+	+	+	+	0	10
	2	+	+	+	+	+	+	+	+	+	+	+	0	10
	3	+	+	+	+	+	+	+	3	+	+	3	10	
	4	5	6	6	6	6	5	+	+	4	5	43	10	
	5	9+	10	12	+	12	10	11	9	12	13	89	10	
	6	8	+	+	14	+	1	+	10	+	+	41	10	
	7	15'	19'	11'	23'	18'	18'	15	+	17'	14'	150	10	
	8													
	Total	28	35	29	43	36	34	26	30	33	32	326	10	
6.25%	0	+	+	+	+	+	+	+	+	+	+	+	0	10
	1	+	+	+	+	+	+	+	+	+	+	+	0	10
	2	+	+	+	+	+	+	+	+	+	+	+	0	10
	3	+	+	+	+	+	+	+	2	+	+	2	10	
	4	5	5	4	6	4	5	5	+	5	6	45	10	
	5	+	+	11	+	+	12	13	8	14	13	71	10	
	6	10	11	+	17	16	+	+	15	+	+	69	10	
	7	10	16	15	15	18	12	14	20	+	19	119	10	
	8													
	Total	25	32	30	38	38	29	32	25	19	38	306	10	
LEGEND: + = Live - = Dead ♂ = Male M = Missing Calculations Initials: MW Date: 9/24/20	7.7%	0	+	+	+	+	+	+	+	+	+	+	0	10
		1	+	+	+	+	+	+	+	+	+	+	0	10
		2	+	+	+	+	+	+	+	+	+	+	0	10
		3	+	+	+	+	+	+	+	+	+	+	0	10
		4	5	5	5	4	6	4	6	+	5	6	46	10
		5	+	+	10	+	19	11	11	6	+	15	72	10
		6	10	12	2	14	+	+	+	14	+	+	52	10
		7	+	16	19	15	22	17	12	+	18	24	140	10
		8											63	10
		Total	15	33	36	33	47	32	29	20	23	45	313	10

P:\General Projects\Client Specific Files\Ayer\Chronic Bench Sheets - old.docx

Ceriodaphnia dubia CHRONIC REPRODUCTION ASSAY (page 2 of 2)

STUDY	Sample	DAY	A	B	C	D	E	F	G	H	I	J	Sum	Surv.
34500	12.5%	0	+	+	+	+	+	+	+	+	+	+	0	10
CLIENT: Ayer WWTF		1	+	+	+	+	+	+	+	+	+	+	0	10
SAMPLE: Effluent		2	+	+	+	+	+	+	+	+	+	+	0	10
DILUENT: RW		3	+	+	+	+	+	+	+	3	+	+	3	10
Cerio Data Source: MSR <input type="checkbox"/> MHR <input checked="" type="checkbox"/>		4	5	5	5	5	4	5	5	+	4	5	43	10
		5	+	+	11	15	9	10	9	11	12	17	94	10
		6	16	11	+	18	+	+	+	11	+	+	50	10
		7	11	14	13	15	18	16	15	+	18	17	122	10
		8												
		Total	26	30	29	38	31	31	29	25	34	39	312	10
	25%	0	+	+	+	+	+	+	+	+	+	+	0	10
Day 0 09/17/20 Time: 1130 Initials: GCS		1	+	+	+	+	+	+	+	+	+	+	0	10
Day 1 09/18/20 Time: 1500 Initials: CL		2	+	+	+	+	+	+	+	+	+	+	0	9
Day 2 09/19/20 Time: 1630 Initials: PBS		3	+	+	+	+	+	+	+	+	+	+	0	9
Day 3 09/20/20 Time: 1450 Initials: PBS		4	5	3	6	4	6	+	3	+		5	32	9
Day 4 09/21/20 Time: 1515 Initials: GCS		5	13	+	13	+	1	3	10	8		13	45	9
Day 5 09/22/20 Time: 1410 Initials: CC		6	+	12	9	+	+	+	14	+		+	35	9
Day 6 09/23/20 Time: 1215 Initials: PBS		7	14	19	16	13	18	+	+	15		18	97	9
Day 7 09/24/20 Time: 1155 Initials: CFS		8												
Day 8 Time: Initials:		Total	19	34	28	17	25	0	27	23	0	36	209	9
	50%	0	+	+	+	+	+	+	+	+	+	+	0	10
Day 0 09/17/20 Time: 1130 Initials: GCS		1	+	+	+	+	+	+	+	+	+	+	0	9
Day 1 09/18/20 Time: 1500 Initials: CC		2	+	+	+	+	+	+	+	+	+	+	0	9
Day 2 09/19/20 Time: 1630 Initials: PBS		3	+	+	+	+	+	+	+	+	+	+	0	9
Day 3 09/20/20 Time: 1450 Initials: PBS		4	4	3	4	6	5	+	5		6	6	38	9
Day 4 09/21/20 Time: 1515 Initials: GCS		5	+	+	12	+	12	2	11		13	6	54	9
Day 5 09/22/20 Time: 1410 Initials: CC		6	11	+	+	15	+	+	+		+	+	26	9
Day 6 09/23/20 Time: 1215 Initials: PBS		7	15	14	15	4	25	+	18		14	21	126	9
Day 7 09/24/20 Time: 1155 Initials: CFS		8												
Day 8 Time: Initials:		Total	30	17	31	25	42	0	34	0	33	33	245	9
LEGEND: + = Live - = Dead ♂ = Male M = Missing	100%	0	+	+	+	+	+	+	+	+	+	+	0	10
Calculations Initials: MW Date: 9/24/20		1	+	+	+	+	+	+	+	+	+	+	0	10
		2	+	+	+	+	+	+	+	+	+	+	0	10
		3	+	+	+	+	+	+	+	5	+	+	5	10
		4	5	5	3	6	4	4	5	+	6	5	43	10
		5	+	12	9	+	+	10	9	8	8	13	69	10
		6	9	+	+	13	+	+	+	13	+	+	35	10
		7	16	16	7	19	14	17	12	+	15	25	141	10
		8												
		Total	30	33	19	38	18	31	26	26	29	43	293	10

STANDARD REFERENCE TOXICANT ANALYSIS

Exposure: 7 day Chronic

Species: Ceriodaphnia dubia

Toxicant: Copper - ug/L

Endpoint: Survival

DATE		C-NOEC	Mean	Std Dev	CV	CT	-1 Conc	+1 Conc	Notes
2/19/2019	1	30	25.50	7.05	27.66	30	15	60	
3/19/2019	2	30	25.50	7.05	27.66	30	15	60	
4/23/2019	3	15	25.50	7.05	27.66	30	15	60	
4/30/2019	4	30	25.50	7.05	27.66	30	15	60	
6/4/2019	5	30	25.50	7.05	27.66	30	15	60	
7/30/2019	6	30	25.50	7.05	27.66	30	15	60	
8/27/2019	7	30	25.50	7.05	27.66	30	15	60	
9/24/2019	8	15	25.50	7.05	27.66	30	15	60	
10/1/2019	9	15	25.50	7.05	27.66	30	15	60	
10/29/2019	10	15	25.50	7.05	27.66	30	15	60	
12/3/2019	11	15	25.50	7.05	27.66	30	15	60	
12/10/2019	12	15	25.50	7.05	27.66	30	15	60	
1/21/2020	13	30	25.50	7.05	27.66	30	15	60	
2/27/2020	14	30	25.50	7.05	27.66	30	15	60	00CdEAH022720
3/17/2020	15	30	25.50	7.05	27.66	30	15	60	00CdEAH031720
4/22/2020	16	30	25.50	7.05	27.66	30	15	60	00CdEAH042220
5/27/2020	17	30	25.50	7.05	27.66	30	15	60	00CdEAH052720
6/2/2020	18	30	25.50	7.05	27.66	30	15	60	00CdEAH060220
7/28/2020	19	30	25.50	7.05	27.66	30	15	60	00CdEAH072820
9/1/2020	20	30	25.50	7.05	27.66	30	15	60	00CdEAH090120

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Ayer Massachusetts WWTF Effluent Evaluation, September 2020.
Study Numbers 34500.

Data Appendix Page 8

STANDARD REFERENCE TOXICANT ANALYSIS

Exposure: 7 day Chronic

Species: Ceriodaphnia dubia

Toxicant: Copper - ug/L

Endpoint: Reproduction

DATE		C-NOEC	Mean	Std Dev	CV	CT	-1 Conc	+1 Conc	Notes
2/19/2019	1	30	20.25	8.46	41.80	30	15	60	
3/19/2019	2	15	20.25	8.46	41.80	30	15	60	
4/23/2019	3	7.5	20.25	8.46	41.80	30	15	60	
4/30/2019	4	15	20.25	8.46	41.80	30	15	60	
6/4/2019	5	30	20.25	8.46	41.80	30	15	60	
7/30/2019	6	15	20.25	8.46	41.80	30	15	60	
8/27/2019	7	30	20.25	8.46	41.80	30	15	60	
9/24/2019	8	15	20.25	8.46	41.80	30	15	60	
10/1/2019	9	15	20.25	8.46	41.80	30	15	60	
10/29/2019	10	15	20.25	8.46	41.80	15	7.5	30	
12/3/2019	11	15	20.25	8.46	41.80	15	7.5	30	
12/10/2019	12	15	20.25	8.46	41.80	15	7.5	30	Value based on IC-25=15.4%
1/21/2020	13	7.5	20.25	8.46	41.80	15	7.5	30	
2/27/2020	14	15	20.25	8.46	41.80	15	7.5	30	00CdEAH022720
3/17/2020	15	30	20.25	8.46	41.80	15	7.5	30	00CdEAH031720
4/22/2020	16	15	20.25	8.46	41.80	15	7.5	30	00CdEAH042220
5/27/2020	17	30	20.25	8.46	41.80	15	7.5	30	00CdEAH052720
6/2/2020	18	30	20.25	8.46	41.80	15	7.5	30	00CdEAH060220
7/28/2020	19	30	20.25	8.46	41.80	15	7.5	30	00CdEAH072820
9/1/2020	20	30	20.25	8.46	41.80	15	7.5	30	00CdEAH090120

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Study Numbers 34500.

Data Appendix Page 9

STANDARD REFERENCE TOXICANT ANALYSIS

Exposure: 7 day Chronic

Species: *Ceriodaphnia dubia*

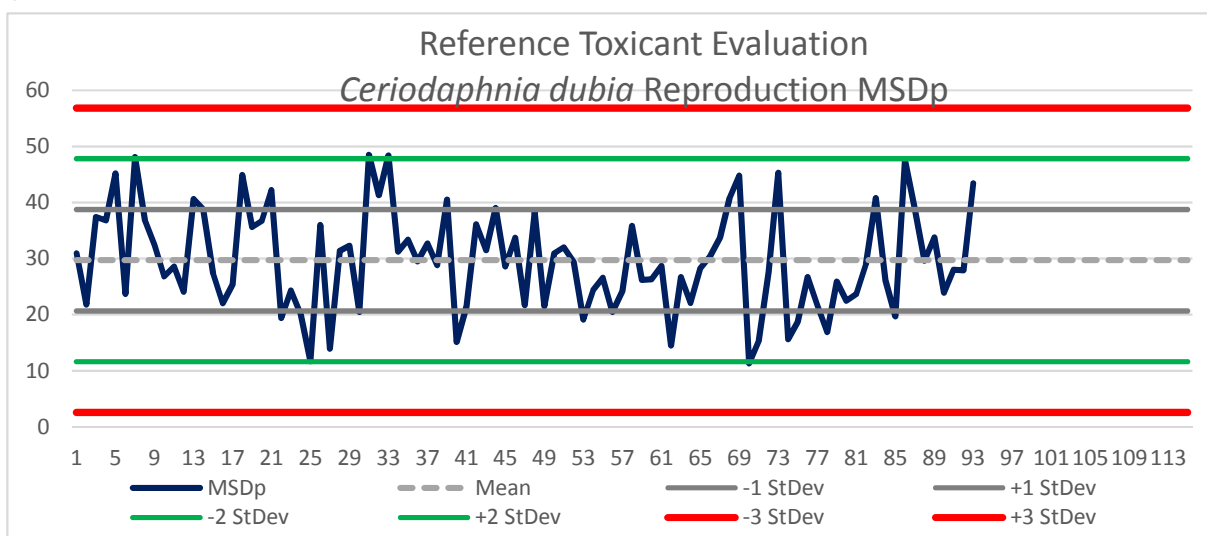
Toxicant: Copper - ug/L

Temperature: 25C

Long Term Mean: 29.7

Long Term CV: 30%

Date		MSDp	Mean	Std	2 Std	CV	Mean	Mean	Mean	Mean	Mean	Mean
				Dev	Dev		-1 Std	+1 Std	-2 Std	+2 Std	-3 Std	+3 Std
2/19/2019		15.6	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84
3/19/2019	75	18.7	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84
4/23/2019		26.7	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84
4/30/2019		21.7	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84
6/4/2019		16.9	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84
7/30/2019		25.9	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84
8/27/2019	80	22.5	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84
9/24/2019		23.7	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84
10/1/2019		29	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84
10/29/2019		40.8	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84
12/3/2019		26.1	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84
12/10/2019	85	19.7	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84
1/21/2020		47.6	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84
2/27/2020		38.8	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84
3/17/2020		29.6	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84
4/22/2020		33.8	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84
5/27/2020	90	23.9	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84
6/2/2020		28.0	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84
7/28/2020		27.9	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84
9/1/2020		43.4	29.70	9.05	18.10	30.47	20.65	38.75	11.60	47.80	2.56	56.84



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CETIS Test Data Worksheet

Report Date: 24 Sep-20 14:28 (p 1 of 3)
Test Code/ID: 34500Cd / 01-7562-1249

Ceriodaphnia 7-d Survival and Reproduction Test

Enthalpy Analytical, LLC

Start Date: 17 Sep-20 12:30 Species: Ceriodaphnia dubia Sample Code: 34500Cd
End Date: 24 Sep-20 11:55 Protocol: EPA/821/R-02-013 (2002) Sample Source: Ayer WWTF
Sample Date: 16 Sep-20 06:15 Material: WWTP, Municipal Treatment Plant Sample Station: MA0100013; Final Discharge

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male	Notes
0	MS	1	44	1							1	27 ✓	0	
0	MS	2	18	1							1	30 ✓	0	
0	MS	3	69	1							1	28 ✓	0	
0	MS	4	30	1							1	38 ✓	0	
0	MS	5	47	1							1	41 ✓	0	
0	MS	6	57	1							1	30 ✓	0	
0	MS	7	51	1							1	29 ✓	0	
0	MS	8	11	1							1	29 ✓	0	
0	MS	9	71	1							1	32 ✓	0	
0	MS	10	53	1							1	40 ✓	0	
0	RW	1	74	1							1	28 ✓	0	
0	RW	2	55	1							1	35 ✓	0	
0	RW	3	66	1							1	29 ✓	0	
0	RW	4	22	1							1	43 ✓	0	
0	RW	5	56	1							1	36 ✓	0	
0	RW	6	77	1							1	34 ✓	0	
0	RW	7	35	1							1	26 ✓	0	
0	RW	8	39	1							1	30 ✓	0	
0	RW	9	43	1							1	33 ✓	0	
0	RW	10	26	1							1	32 ✓	0	
6.25		1	45	1							1	25 ✓	0	
6.25		2	54	1							1	32 ✓	0	
6.25		3	14	1							1	30 ✓	0	
6.25		4	40	1							1	38 ✓	0	
6.25		5	32	1							1	38 ✓	0	
6.25		6	33	1							1	29 ✓	0	
6.25		7	49	1							1	32 ✓	0	
6.25		8	68	1							1	25 ✓	0	
6.25		9	62	1							1	19 ✓	0	
6.25		10	52	1							1	38 ✓	0	
7.7		1	27	1							1	15 ✓	0	
7.7		2	3	1							1	33 ✓	0	
7.7		3	80	1							1	36 ✓	0	
7.7		4	67	1							1	33 ✓	0	

CETIS Test Data Worksheet

Report Date: 24 Sep-20 14:28 (p 2 of 3)
Test Code/ID: 34500Cd / 01-7562-1249

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male	Notes
7.7		5	38	1							1	47 ✓	0	
7.7		6	31	1							1	32 ✓	0	
7.7		7	7	1							1	29 ✓	0	
7.7		8	79	1							1	20 ✓	0	
7.7		9	21	1							1	23 ✓	0	
7.7		10	20	1							1	45 ✓	0	
12.5		1	8	1							1	26 ✓	0	
12.5		2	10	1							1	30 ✓	0	
12.5		3	16	1							1	29 ✓	0	
12.5		4	60	1							1	38 ✓	0	
12.5		5	5	1							1	31 ✓	0	
12.5		6	13	1							1	31 ✓	0	
12.5		7	50	1							1	29 ✓	0	
12.5		8	70	1							1	25 ✓	0	
12.5		9	34	1							1	34 ✓	0	
12.5		10	15	1							1	39 ✓	0	
25		1	65	1							1	19 ✓	0	
25		2	42	1							1	34 ✓	0	
25		3	25	1							1	28 ✓	0	
25		4	2	1							1	17 ✓	0	
25		5	23	1							1	25 ✓	0	
25		6	4	1							1		-1 ✓	
25		7	73	1							1	27 ✓	0	
25		8	63	1							1	23 ✓	0	
25		9	76	1							0	0 ✓	0	
25		10	1	1							1	36 ✓	0	
50		1	24	1							1	30 ✓	0	
50		2	17	1							1	17 ✓	0	
50		3	58	1							1	31 ✓	0	
50		4	78	1							1	25 ✓	0	
50		5	59	1							1	42 ✓	0	
50		6	28	1							1		-1	
50		7	9	1							1	34 ✓	0	
50		8	36	1							0	0	0	
50		9	61	1							1	33 ✓	0	
50		10	64	1							1	33 ✓	0	
100		1	46	1							1	30 ✓	0	
100		2	6	1							1	33 ✓	0	

CETIS Test Data Worksheet

Report Date: 24 Sep-20 14:28 (p 3 of 3)
 Test Code/ID: 34500Cd / 01-7562-1249

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male	Notes
100		3	12	1							1	19 ✓	0	
100		4	48	1							1	38 ✓	0	
100		5	19	1							1	18 ✓	0	
100		6	41	1							1	31 ✓	0	
100		7	75	1							1	26 ✓	0	
100		8	72	1							1	26 ✓	0	
100		9	29	1							1	29 ✓	0	
100		10	37	1							1	43 ✓	0	

CETIS Summary Report

Report Date: 24 Sep-20 14:28 (p 1 of 1)
Test Code/ID: 34500Cd / 01-7562-1249

Ceriodaphnia 7-d Survival and Reproduction Test										Enthalpy Analytical, LLC			
Batch ID:	11-5453-1193			Test Type:	Reproduction-Survival (7d)			Analyst:	Meredith Wheeler				
Start Date:	17 Sep-20 12:30			Protocol:	EPA/821/R-02-013 (2002)			Diluent:	Receiving Water				
Ending Date:	24 Sep-20 11:55			Species:	Ceriodaphnia dubia			Brine:	Not Applicable				
Test Length:	6d 23h			Taxon:	Branchiopoda			Source:	In-House Culture		Age: <24		
Sample ID:	14-1540-9527			Code:	34500Cd			Project:	Third Quarter WET Compliance Test				
Sample Date:	16 Sep-20 06:15			Material:	WWTP, Municipal Treatment Plant			Source:	Ayer WWTF				
Receipt Date:	16 Sep-20 07:15			CAS (PC):				Station:	MA0100013; Final Discharge				
Sample Age:	30h (9 °C)			Client:	Town of Ayer, DPW								
Multiple Comparison Summary													
Analysis ID	Endpoint	Comparison Method					✓	NOEL	LOEL	TOEL	TU	PMSD	S
03-6694-2640	7d Proportion Survived	Fisher Exact/Bonferroni-Holm Test						100	>100	n/a	1	n/a	1
16-7351-5062	Reproduction	Bonferroni Adj t Test						100	>100	n/a	1	28.5%	1
7d Proportion Survived Summary													
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect		
0	MS	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%		
0	RW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%		
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%		
7.7		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%		
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%		
25		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%		
50		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%		
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%		
Reproduction Summary													
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect		
0	MS	10	32.4	28.7	36.1	27	41	1.65	5.23	16.15%	0.00%		
0	RW	10	32.6	29.1	36.1	26	43	1.54	4.86	14.90%	-0.62%		
6.25		10	30.6	26	35.2	19	38	2.02	6.4	20.91%	5.56%		
7.7		10	31.3	24	38.6	15	47	3.21	10.2	32.48%	3.40%		
12.5		10	31.2	27.9	34.5	25	39	1.46	4.61	14.79%	3.70%		
25		9	23.2	15	31.4	0	36	3.57	10.7	46.07%	28.33%		
50		9	27.2	17.8	36.7	0	42	4.09	12.3	45.06%	15.98%		
100		10	29.3	23.8	34.8	18	43	2.44	7.72	26.34%	9.57%		
7d Proportion Survived Detail													
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10		
0	MS	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
0	RW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
7.7		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	1.000		
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	1.000	1.000		
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
Reproduction Detail													
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10		
0	MS	27	30	28	38	41	30	29	29	32	40		
0	RW	28	35	29	43	36	34	26	30	33	32		
6.25		25	32	30	38	38	29	32	25	19	38		
7.7		15	33	36	33	47	32	29	20	23	45		
12.5		26	30	29	38	31	31	29	25	34	39		
25		19	34	28	17	25		27	23	0	36		
50		30	17	31	25	42		34	0	33	33		
100		30	33	19	38	18	31	26	26	29	43		

CETIS Analytical Report

Report Date: 24 Sep-20 14:28 (p 1 of 1)
Test Code/ID: 34500Cd / 01-7562-1249

Ceriodaphnia 7-d Survival and Reproduction Test

Enthalpy Analytical, LLC

Analysis ID: 16-7351-5062	Endpoint: Reproduction	CETIS Version: CETISv1.9.6
Analyzed: 24 Sep-20 14:28	Analysis: Parametric-Multiple Comparison	Status Level: 1
Sample ID: 14-1540-9527	Code: 34500Cd	Project: Third Quarter WET Compliance Test
Sample Date: 16 Sep-20 06:15	Material: WWTP, Municipal Treatment Plant	Source: Ayer WWTF
Receipt Date: 16 Sep-20 07:15	CAS (PC):	Station: MA0100013; Final Discharge
Sample Age: 30h (9 °C)	Client: Town of Ayer, DPW	

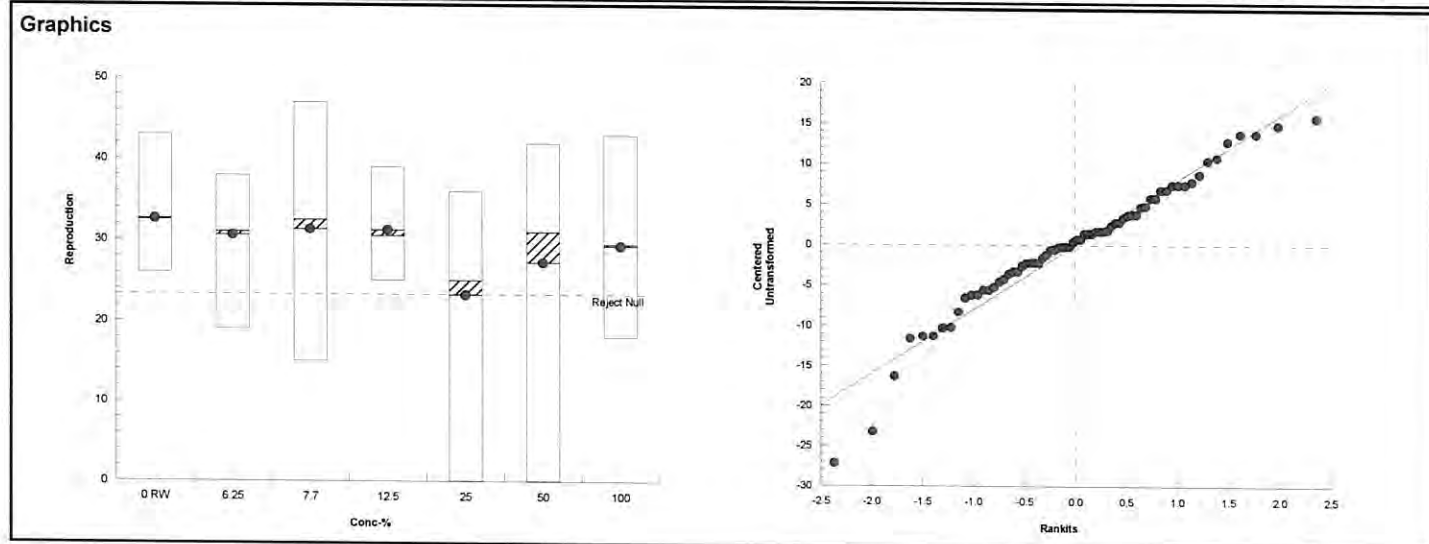
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	>100	n/a	1	28.54%

Bonferroni Adj t Test									
Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Receiving Water		6.25	0.529	2.46	9.31	18	CDF	1.0000	Non-Significant Effect
		7.7	0.344	2.46	9.31	18	CDF	1.0000	Non-Significant Effect
		12.5	0.37	2.46	9.31	18	CDF	1.0000	Non-Significant Effect
		25	2.41	2.46	9.56	17	CDF	0.0563	Non-Significant Effect
		50	1.38	2.46	9.56	17	CDF	0.5135	Non-Significant Effect
		100	0.873	2.46	9.31	18	CDF	1.0000	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	571.23	95.205	6	1.33	0.2566	Non-Significant Effect
Error	4357.71	71.4379	61			
Total	4928.94		67			

ANOVA Assumptions Tests					
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	13.9	16.8	0.0313	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.959	0.951	0.0249	Normal Distribution

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	RW	10	32.6	29.1	36.1	32.5	26	43	1.54	14.90%	0.00%
6.25		10	30.6	26	35.2	31	19	38	2.02	20.91%	6.13%
7.7		10	31.3	24	38.6	32.5	15	47	3.21	32.48%	3.99%
12.5		10	31.2	27.9	34.5	30.5	25	39	1.46	14.79%	4.29%
25		9	23.2	15	31.4	25	0	36	3.57	46.07%	28.77%
50		9	27.2	17.8	36.7	31	0	42	4.09	45.06%	16.50%
100		10	29.3	23.8	34.8	29.5	18	43	2.44	26.34%	10.12%



CETIS Analytical Report

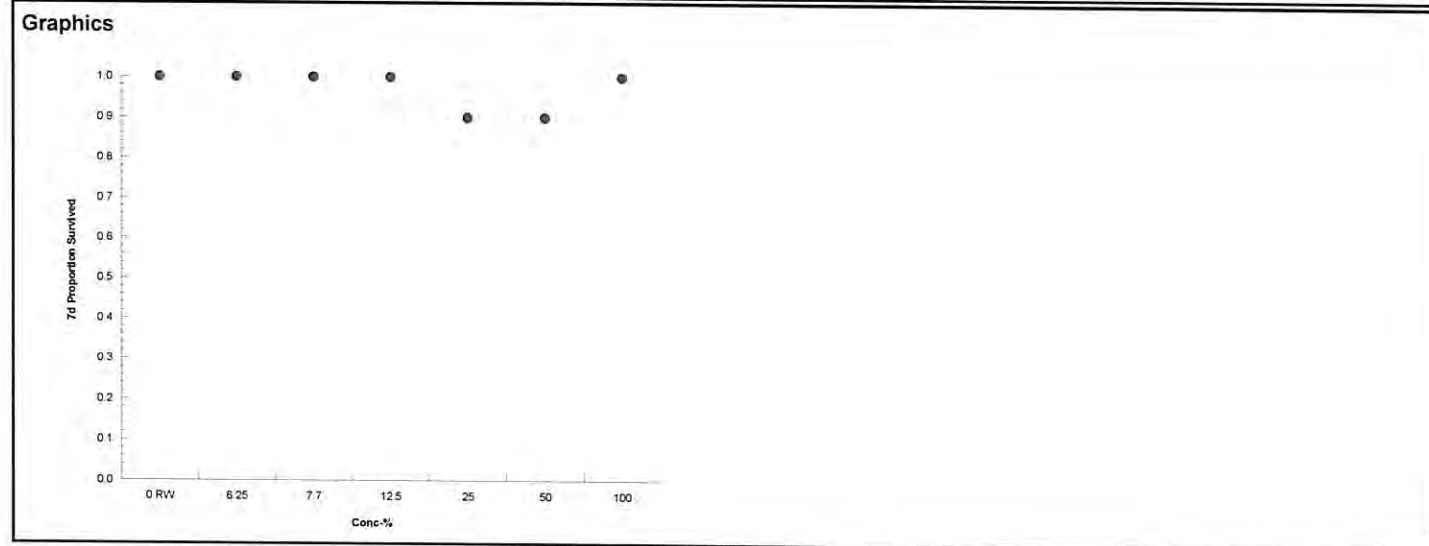
Report Date: 24 Sep-20 14:28 (p 1 of 1)
Test Code/ID: 34500Cd / 01-7562-1249

Ceriodaphnia 7-d Survival and Reproduction Test			Enthalpy Analytical, LLC	
Analysis ID: 03-6694-2640	Endpoint: 7d Proportion Survived	CETIS Version: CETISv1.9.6		
Analyzed: 24 Sep-20 14:28	Analysis: STP 2xK Contingency Tables	Status Level: 1		
Sample ID: 14-1540-9527	Code: 34500Cd	Project: Third Quarter WET Compliance Test		
Sample Date: 16 Sep-20 06:15	Material: WWTP, Municipal Treatment Plant	Source: Ayer WWTF		
Receipt Date: 16 Sep-20 07:15	CAS (PC):	Station: MA0100013; Final Discharge		
Sample Age: 30h (9 °C)	Client: Town of Ayer, DPW			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	>100	n/a	1

Fisher Exact/Bonferroni-Holm Test						
Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Receiving Water		6.25	1.000	Exact	1.0000	Non-Significant Effect
		7.7	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	0.500	Exact	1.0000	Non-Significant Effect
		50	0.500	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary							
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	RW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
7.7		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		9	1	10	0.9	0.1	10.0%
50		9	1	10	0.9	0.1	10.0%
100		10	0	10	1	0	0.0%



***Ceriodaphnia dubia* - Blocking by Parentage
Tracking Sheet**

ESI #: 34500

CLIENT: Ayer

START DATE: 09/17/20

START TIME: 1230

INITIAL: GRS

COLUMN added to	<i>C. dubia</i> ADULT USED	
	board #	cup#
A	MHR 1009	2E
B	MHR 1010	1A
C		1C
D		1D
E		1E
F		2F
G		1G
H		1H
I		1I
J	↓	1J

FRESHWATER CHRONIC ASSAY – NEW WATER QUALITIES

STUDY: 34500		CLIENT: Ayer WWTF								SAMPLE: Effluent				DILUENT: RW			
NEW DISSOLVED OXYGEN (mg/L)										NEW pH (SU)							
Sample	Rep	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
MSR	A	8.6	8.7	8.8	8.8	8.8	8.7	8.5		7.87	7.70	7.83	7.83	7.79	7.73	7.82	
RW	A	9.1	8.7	8.9	8.8	8.9	9.0	9.1		7.14	7.31	7.22	7.11	7.25	7.27	7.22	
6.25%	A	9.1	8.7	8.9	8.8	8.8	9.0	9.0		7.24	7.33	7.37	7.24	7.30	7.41	7.36	
7.7%	A	9.1	8.8	8.8	8.8	8.9	9.0	9.0		7.31	7.40	7.39	7.26	7.35	7.46	7.39	
12.5%	A	9.1	8.7	8.9	8.8	8.8	9.0	9.0		7.38	7.44	7.49	7.34	7.44	7.54	7.48	
25%	A	9.2	8.7	8.8	8.8	8.8	9.1	9.0		7.57	7.56	7.60	7.49	7.51	7.72	7.66	
50%	A	9.3	8.9	8.8	8.7	8.7	9.1	8.9		7.78	7.81	7.75	7.66	7.67	7.95	7.87	
100%	A	9.7	9.0	8.9	8.7	8.4	9.2	9.0		7.94	8.07	7.87	7.75	7.77	8.06	8.00	
NEW SPECIFIC CONDUCTIVITY (µMHOS/cm)										NEW TEMPERATURE (°C)							
Sample	Rep	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
MSR	A	211	208	210	216	206	205	206		23	23	22	22	23	23	23	
RW	A	488	478	506	526	526	495	497		23	23	22	24	24	23	24	
6.25%	A	350	543	564	587	584	562	562		23	23	22	24	24	23	24	
7.7%	A	563	554	576	597	597	575	575		23	23	22	24	24	23	24	
12.5%	A	607	603	617	638	635	618	623		23	23	22	24	24	23	24	
25%	A	732	705	731	745	745	739	750		23	23	22	24	24	23	24	
50%	A	966	946	936	965	953	985	1003		23	23	22	24	24	23	24	
100%	A	1434	1401	1355	1414	1383	1446	1480		23	23	22	24	23	23	24	
DATE:		09/17/20	09/18/20	09/19	09/20	09/21/20	09/22	09/23									
TIME:		11:30	1335	1215	1050	1120	1130	0940									
INITIALS:		CC	MW	CC	CMC	GRC	CC	CFS									

**Ceriodaphnia dubia CHRONIC REPRODUCTION ASSAY
OLD WATER QUALITY DATA**

STUDY: 34500						CLIENT: Ayer WWTF						SAMPLE: Effluent						DILUENT: RW		
Sample	DAY	pH (SU)	DO (mg/L)	Temp (°C)	S/C (µMHOS/cm)	Sample	DAY	pH (SU)	DO (mg/L)	Temp (°C)	S/C (µMHOS/cm)	INC ID	INC Temp	Initials						
MSR	1	8.03	9.1	20	226	12.5%	1	8.18	8.9	20	624	2	25	CC						
	2	8.06	9.0	19	242		2	8.16	9.0	19	683	2	25	BG						
	3	8.13	9.2	20	256		3	8.15	9.0	19	639	2	25	GRS						
	4	8.02	9.1	21	238		4	8.08	9.0	21	648	2	25	GRS						
	5	8.10	9.0	22	251		5	8.15	8.9	23	711	2	25	CML						
	6	7.94	8.6	23	242		6	8.12	8.6	22	710	2	25	CC						
	7	7.81	8.7	23	266		7	8.14	8.6	23	680	2	25	BG						
	8						8													
RW	1	7.99	9.0	20	512	25%	1	8.33	8.9	20	750	RW = Receiving Water								
	2	8.02	9.0	19	547		2	8.31	8.9	19	813									
	3	8.04	9.1	20	537		3	8.31	9.0	20	753									
	4	7.96	9.1	21	548		4	8.23	9.0	20	757									
	5	8.03	9.0	23	599		5	8.24	9.0	23	831									
	6	7.95	8.6	23	578		6	8.36	8.6	22	842									
	7	7.83	8.6	23	549		7	8.29	8.6	23	814									
	8						8													
6.25%	1	8.09	8.9	20	576	50%	1	8.52	8.9	20	990									
	2	8.11	8.9	19	625		2	8.49	8.9	19	1068									
	3	8.10	9.0	20	595		3	8.50	8.9	20	959									
	4	8.05	9.0	21	610		4	8.45	9.0	20	975									
	5	8.06	9.0	23	600		5	8.43	9.0	23	1059									
	6	8.08	8.6	23	653		6	8.56	8.6	22	1111									
	7	7.96	8.6	23	624		7	8.51	8.6	23	1085									
	8						8													
7.7%	1	8.11	8.9	20	586	100%	1	8.71	9.0	20	1450									
	2	8.13	9.0	19	632		2	8.68	9.0	19	1561									
	3	8.13	9.0	20	597		3	8.70	8.9	20	1375									
	4	8.07	8.9	21	613		4	8.69	9.0	20	1407									
	5	8.11	9.0	23	609		5	8.60	9.0	23	1516									
	6	8.12	8.6	23	663		6	8.72	8.6	22	1612									
	7	8.04	8.6	23	633		7	8.71	8.6	22	1568									
	8						8													

PREPARATION OF DILUTIONS

STUDY: 34500		CLIENT: Ayer	
SPECIES: <i>C. dubia</i>			
Diluent: Receiving Water		$E_0 = 24.4^\circ\text{C}$ $D_0 = 24.6^\circ\text{C}$ Sample: E_0, D_0	
Concentration %	Vol. Eff. (mL)	Final Vol. (mL)	
MSR	0	100	
Receiving Water	0	100	
6.25%	6.25	100	
12.5%	12.5	100	
25%	25	100	
50%	50	100	
100%	100	100	
INITIALS:	CMC		
TIME:	0955		
DATE:	09/17/20		

PREPARATION OF DILUTIONS

STUDY: 34500	CLIENT: Ayer WWTF	Thermometer ID: T-295
SPECIES: <i>C. dubia</i>	TEST: Chronic	DILUENT: Receiving Water

START	Day: 0	Day: 1
Diluent: RW	Sample: E_0, D_0	Sample: E_1, D_1
Concentration	Vol Eff	Final Vol
MSR	0	200
RW	0	0
6.25%	12.5	12.5
7.7%	15.4	15.4
12.5%	25	25
25%	50	50
50%	100	100
100%	200	200
TRC VALUE:	0.02	

Day	Date / Time / Init	Selenastrum	YCT
0	09/17/20 1000 OMC	A-6036	F143
1	09/18/20 0945 BC	A-6036	F143
2	09/19/20 0915 CC	A-6036	F143
3	09/20/20 1015 GKS	A-6036	F143
4	09/21/20 1020 GKS	A-6048	F143
5	09/22/20 0815 CFS	A-6048	F143
6	09/23/20 0825 CFS	A-6048	F143
7			

1st Renewal	Day: 2	Day: 3	Day: 4
Diluent: RW	Sample: E_2, D_2	Sample: E_3, D_3	Sample: E_4, D_4
Concentration	Vol Eff	Final Vol	Vol Eff
MSR	0	200	0
RW	0	0	0
6.25%	12.5	12.5	12.5
7.7%	15.4	15.4	15.4
12.5%	25	25	25
25%	50	50	50
50%	100	100	100
100%	200	200	200
TRC VALUE:	0.02		

Lab Water ID:	
Day 0	34431, W-1312
Day 1	34431, W-1312
Day 2	34431, W-1312
Day 3	34431, W-1312
Day 4	34510, W-1318
Day 5	34510, W-1318
Day 6	34510, W-1318
Day 7	

2nd Renewal	Day: 5	Day: 6	Day:	Day:
Diluent: RW	Sample: E_5, D_5	Sample: E_6, D_6	Sample:	Sample:
Concentration	Vol Eff	Final Vol	Vol Eff	Final Vol
MSR	0	200		
RW	0	0		
6.25%	12.5	12.5		
7.7%	14.4	14.4		
12.5%	25	25		
25%	50	50		
50%	100	100		
100%	200	200		
TRC VALUE:	0.02			

RECORD OF METERS USED

STUDY: 34500		CLIENT: Town of Ayer DPW	
C. dubia			
Exposure (Hours)			
	0	24	48
Water Quality Station #	2	1	2
Initials / Date	CL 09/17/20	CPS 09/18	CL 09/19

Water Quality Station #1		Water Quality Station #2		COMMENTS
DO meter #		DO meter #		
DO probe #		DO probe #		
pH meter #		pH meter #		
pH probe #		pH probe #		
S/C meter #		S/C meter #		
S/C probe #		S/C probe #		

RECORD OF METERS USED FOR WATER QUALITY MEASUREMENTS

STUDY: 34500		CLIENT: Ayer WWTF							
OLD WATER QUALITIES									
Day	0	1	2	3	4	5	6	7	8
Station #		1	1	2	2	1	2	2	
Initials		CC	BR	GRS	09/21/20 GRS	CMC	CC	BR	
NEW WATER QUALITIES									
Day	0	1	2	3	4	5	6	7	8
Station #	2	1	1	2	1	1	1		
Initials	CC	MW	CC	CMC	GRS	CC	CFS		
Date	09/17/20	9/18	9/19/20	09/20	09/21/20	09/22/20	09/23	09/24/20	

Water Quality Station # 1		Water Quality Station # 2	
Meter ID:	ML01	Meter ID:	ML02
DO Probe ID:	96	DO Probe ID:	160
pH Probe ID:	168	pH Probe ID:	169
S/C Probe ID:	151	S/C Probe ID:	1

Report No: 34500
Project: Ayer

SDG:

Sample ID: Effluent Start
Matrix: Water
Sampled: 09/17/20 0615

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Total solids	34500-007	880	20	mg/L	09/21/20 1450	09/22/20 1155	JTP/SM 2540B
Total dissolved solids	34500-007	940	20	mg/L	09/23/20 0845	09/23/20 0845	BG /Probe
Alkalinity as CaCO3	34500-004	270	10	mg/L	09/23/20 1155	09/23/20 1155	AS /EPA 310.2
Total organic carbon	34500-003	6.8	1.2	mg/L	09/28/20 0930	09/28/20 1010	AS /SM 5310 B
Ammonia-N	34500-006	ND	0.1	mg/L as N	09/22/20 1132	09/22/20 1132	AS /SM 4500-NH3 G
Hardness as CaCO3	34500-005	230	0.7	mg/L	09/21/20 1400	09/21/20 1934	AS /ess/SW846 3rd Ed. 6020
Aluminum, total	34500-002	0.086	0.02	mg/L	09/18/20 0825	09/18/20 2136	AS /EPA 200.8
Cadmium, total	34500-002	ND	0.0003	mg/L	09/18/20 0825	09/18/20 2136	AS /EPA 200.8
Calcium, total	34500-002	68.7	0.1	mg/L	09/18/20 0825	09/18/20 2136	AS /EPA 200.8
Copper, total	34500-002	0.0021	0.0005	mg/L	09/18/20 0825	09/18/20 2136	AS /EPA 200.8
Lead, total	34500-002	ND	0.0003	mg/L	09/18/20 0825	09/18/20 2136	AS /EPA 200.8
Magnesium, total	34500-002	12.4	0.1	mg/L	09/18/20 0825	09/18/20 2136	AS /EPA 200.8
Nickel, total	34500-002	0.0035	0.001	mg/L	09/18/20 0825	09/18/20 2136	AS /EPA 200.8
Zinc, total	34500-002	0.015	0.002	mg/L	09/18/20 0825	09/18/20 2136	AS /EPA 200.8

Sample ID: Effluent First Renewal
Matrix: Water
Sampled: 09/18/20 0630

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO3	34500-017	280	10	mg/L	09/23/20 1156	09/23/20 1156	AS /EPA 310.2
Ammonia-N	34500-019	ND	0.1	mg/L as N	09/22/20 1134	09/22/20 1134	AS /SM 4500-NH3 G
Hardness as CaCO3	34500-018	250	0.7	mg/L	09/21/20 1400	09/21/20 1939	AS /ess/SW846 3rd Ed. 6020

Sample ID: Effluent Second Renewal
Matrix: Water
Sampled: 09/21/20 0630

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO3	34500-027	310	20	mg/L	09/23/20 1158	09/23/20 1158	AS /EPA 310.2
Ammonia-N	34500-029	ND	0.1	mg/L as N	09/22/20 1136	09/22/20 1136	AS /SM 4500-NH3 G
Hardness as CaCO3	34500-028	250	0.7	mg/L	09/28/20 1130	09/28/20 1308	AS /ess/SW846 3rd Ed. 6020

Notes:

ND = Not Detected

Report No: 34500
Project: Ayer

SDG:

Sample ID: Receiving Water Start
Matrix: Water
Sampled: 09/17/20 0615

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO3	34500-011	45	2	mg/L	09/23/20 1130	09/23/20 1130	AS /EPA 310.2
Total organic carbon	34500-010	4.3	1	mg/L	09/28/20 0930	09/28/20 1010	AS /SM 5310 B
Ammonia-N	34500-013	ND	0.1	mg/L as N	09/22/20 1133	09/22/20 1133	AS /SM 4500-NH3 G
Hardness as CaCO3	34500-012	63	0.7	mg/L	09/21/20 1400	09/21/20 1937	AS /ess/SW846 3rd Ed. 6020
Aluminum, total	34500-009	0.027	0.02	mg/L	09/18/20 0825	09/18/20 2142	AS /EPA 200.8
Cadmium, total	34500-009	ND	0.0003	mg/L	09/18/20 0825	09/18/20 2142	AS /EPA 200.8
Calcium, total	34500-009	18.6	0.1	mg/L	09/18/20 0825	09/18/20 2142	AS /EPA 200.8
Copper, total	34500-009	0.0039	0.0005	mg/L	09/18/20 0825	09/18/20 2142	AS /EPA 200.8
Lead, total	34500-009	0.001	0.0003	mg/L	09/18/20 0825	09/18/20 2142	AS /EPA 200.8
Magnesium, total	34500-009	3.54	0.1	mg/L	09/18/20 0825	09/18/20 2142	AS /EPA 200.8
Nickel, total	34500-009	0.002	0.001	mg/L	09/18/20 0825	09/18/20 2142	AS /EPA 200.8
Zinc, total	34500-009	0.0074	0.002	mg/L	09/18/20 0825	09/18/20 2142	AS /EPA 200.8

Sample ID: Receiving Water First Renewal
Matrix: Water
Sampled: 09/18/20 0620

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO3	34500-021	40	2	mg/L	09/23/20 1134	09/23/20 1134	AS /EPA 310.2
Ammonia-N	34500-023	ND	0.1	mg/L as N	09/22/20 1135	09/22/20 1135	AS /SM 4500-NH3 G
Hardness as CaCO3	34500-022	67	0.7	mg/L	09/21/20 1400	09/21/20 1941	AS /ess/SW846 3rd Ed. 6020

Sample ID: Receiving Water Second Renewal
Matrix: Water
Sampled: 09/21/20 0640

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO3	34500-031	41	2	mg/L	09/23/20 1135	09/23/20 1135	AS /EPA 310.2
Ammonia-N	34500-033	ND	0.1	mg/L as N	09/22/20 1141	09/22/20 1141	AS /SM 4500-NH3 G
Hardness as CaCO3	34500-032	63	0.7	mg/L	09/28/20 1130	09/28/20 1311	AS /ess/SW846 3rd Ed. 6020

Notes:

ND = Not Detected

SAMPLE RECEIPT RECORD FOR CHRONIC TOXICITY EVALUATIONS

STUDY #: 34500		CLIENT: Ayer	
SAMPLE RECEIPT INFORMATION			
	Start Sample	First Renewal	Second Renewal
Receipt Date & Time:	09/16/20 0715	09/18/20 0700	09/21/20 0700
Received By:	DW	DW	DW
Temperature at Receipt:	9.1°C	16.1°C	1.5°C
Delivered Via:	<input checked="" type="checkbox"/> Enthalpy <input type="checkbox"/> Client <input type="checkbox"/> Courier <input type="checkbox"/> FedEx <input type="checkbox"/> UPS	<input type="checkbox"/> Enthalpy <input type="checkbox"/> Client <input type="checkbox"/> Courier <input type="checkbox"/> FedEx <input type="checkbox"/> UPS	<input checked="" type="checkbox"/> Enthalpy <input type="checkbox"/> Client <input type="checkbox"/> Courier <input type="checkbox"/> FedEx <input type="checkbox"/> UPS
Logged In Date & Time:	09/17/20 0340	09/18/20 1850	09/21/20 1610
Logged at Lab By:	MS	CFS	JTP
Temperature at Log In:	1.8°C	4.6°C	0.9°C
SAMPLE CONDITION INFORMATION			
Chain of Custody?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Chain of Custody Signed?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Chain of Custody Complete?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Sample Date?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Sample Time?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Sample Type?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Custody Seal in Place?	Yes <input checked="" type="radio"/> NA No	Yes <input checked="" type="radio"/> NA No	Yes <input checked="" type="radio"/> NA No
Shipping Container Intact?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Client notified of temp?	Yes or <input checked="" type="radio"/> No	Yes or <input checked="" type="radio"/> No	Yes or <input checked="" type="radio"/> No
Sample Arrived on Ice?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
COMMENTS:	See COC	See COC	See C.O.C

Q:\Forms\Lab Forms\Sampling & Receipt\Sample Receipt Record - Chronic -R1 2019-07-09.docx

**Renee
McIsaac**

Digitally signed by Renee McIsaac
DN: cn=Renee McIsaac, o=Enthalpy
Analytical, ou=Project Manager /
QHS Member,
email=renee.mcsaac@enthalpy.co
m, c=US
Date: 2019.07.09 08:24:23 -0400



CHAIN OF CUSTODY DOCUMENTATION

Client: Ayer, Ma WWTF	Contact: Paula Boyle	Project Name: Ayer, MA Q3 2020	
Report to: Paula Boyle	Address: Hoyle Tanner & Assoc Inc	Project Number: P0064	Task: 0001
Invoice to: Paula Boyle	Address: Manchester, NH 03101	Project Manager: Paula Boyle	
Voice: 603-669-5555	Fax: 603-669-4168	email: sewer@ayer.ma.us	P.O: '

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
001	Effluent Start	9-15 9-16	0645 0645	TW	C	1	3750	P	4 C	Water	N	CD7DCR, CD48AD StartSample
002	Effluent Start	9-15 9-16	0645 0645	TW	C	1	250	P	HNO3	Water	N	Total Metals Cd,Ni,Pb,Cu,Zn,Al,Ca,Mg;
003	Effluent Start	9-15 9-16	0645 0645	TW	C	1	40	G	4 C	Water	N	TOC
004	Effluent Start	9-15 9-16	0645 0645	TW	C	1	125	P	4 C	Water	N	ALK
005	Effluent Start	9-15 9-16	0645 0645	TW	C	1	125	P	HNO3	Water	N	Metals Hard;
006	Effluent Start	9-15 9-16	0645 0645	TW	C	1	125	P	H2SO4	Water	N	NH3;
007	Effluent Start	9-15 9-16	0645 0645	TW	C	1	500	P	4 C	Water	N	TS,TDS

Relinquished By: *[Signature]* Date: 9-16-20 Time: 0715 Received By: *[Signature]* Date: 9-16-20 Time: 0715 Temp (C): 9.1 Meter ID: 304

Relinquished By: *[Signature]* Date: 9-16-20 Time: 1547 Received at Lab By: *[Signature]* Date: 09/16/20 Time: 1547 Temp (C): 1.8 Meter ID: T-295

Comments: Effluent composite sample collected in 30 minute intervals from 0645 9-15-20 through 0645 9-16-20.
48 Total Effluent grab samples taken over 24 Hr. Effluent composite collection period.



CHAIN OF CUSTODY DOCUMENTATION

Client: Ayer, Ma WWTF	Contact: Paula Boyle	Project Name: Ayer, MA Q3 2020	
Report to: Paula Boyle	Address: Hoyle Tanner & Assoc Inc	Project Number: P0064	Task: 0001
Invoice to: Paula Boyle	Address: Manchester, NH 03101	Project Manager: Paula Boyle	
Voice: 603-669-5555	Fax: 603-669-4168	email: sewer@ayer.ma.us	P.O: '

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
008	Receiving Water Start	9-16-20	0705	TW	G	1	3750	P	4 C	Water	N	CD7DCR StartDiluent
009	Receiving Water Start	9-16-20	0705	TW	G	1	250	P	HNO3	Water	N	Total Metals Cd,Ni,Pb,Cu,Zn,Al,Ca,Mg;
010	Receiving Water Start	9-16-20	0705	TW	G	1	40	G	4 C	Water	N	TOC
011	Receiving Water Start	9-16-20	0705	TW	G	1	125	P	4 C	Water	N	Alk
012	Receiving Water Start	9-16-20	0705	TW	G	1	125	P	HNO3	Water	N	Metals Hard;
013	Receiving Water Start	9-16-20	0705	TW	G	1	125	P	H2SO4	Water	N	NH3;

Relinquished By: *[Signature]* Date: 9-16-20 Time: 0715 Received By: *[Signature]* Date: 9-16-20 Time: 0715 Temp (C): 17.7 Meter ID: 304

Relinquished By: *[Signature]* Date: 9-16-20 Time: 15:47 Received at Lab By: *[Signature]* Date: 09/16/20 Time: 1547 Temp (C): 1.8 Meter ID: T-295

Comments: *Receiving Water sample collected upstream of Effluent discharge to Naubia River off of McPherson Rd.*



Enthalpy Analytical
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345

Enthalpy Job No: 34500

CHAIN OF CUSTODY DOCUMENTATION

Client: Ayer, Ma WWTF	Contact: Paula Boyle	Project Name: Ayer, MA	Q3 2020
Report to: Paula Boyle	Address: Hoyle Tanner & Assoc Inc	Project Number: P0064	Task: 0001
Invoice to: Paula Boyle	Address: Manchester, NH 03101	Project Manager: Paula Boyle	
Voice: 603-669-5555	Fax: 603-669-4168	email: sewer@ayer.ma.us	P.O: '

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
014	Effluent First Renewal	9-17 9-18	0700 0630	TW	C	1	3750	P	4 C	Water	N	CD7DCR 1stRenewal Sample
015	Effluent First Renewal	9-17 9-18	0700 0630	TW	C	1	250	P	HNO3	Water	N	Total Metals Cd,Ni,Pb,Cu,Zn,Al,Ca,Mg;
016	Effluent First Renewal	9-17 9-18	0700 0630	TW	C	1	40	G	4 C	Water	N	TOC
017	Effluent First Renewal	9-17 9-18	0700 0630	TW	C	1	125	P	4 C	Water	N	Alk
018	Effluent First Renewal	9-17 9-18	0700 0630	TW	C	1	125	P	HNO3	Water	N	Metals Hard;
019	Effluent First Renewal	9-17 9-18	0700 0630	TW	C	1	125	P	H2SO4	Water	N	NH3;
020	Receiving Water First Renewal	9-18-20	0620	TW	G	1	3750	P	4 C	Water	N	CD7DCR 1stRenewal Diluent
021	Receiving Water First Renewal	9-18-20	0620	TW	G	1	125	P	4 C	Water	N	Alk
022	Receiving Water First Renewal	9-18-20	0620	TW	G	1	125	P	HNO3	Water	N	Metals Hard;
023	Receiving Water First Renewal	9-18-20	0620	TW	G	1	125	P	H2SO4	Water	N	NH3;

Relinquished By: *[Signature]* Date: 9-18-20 Time: 7:00 Received By: *[Signature]* Date: 9-18-20 Time: 7:00 Temp (C): 16.1 Meter ID: 304

Relinquished By: *[Signature]* Date: 9-18-20 Time: 12:25 Received at Lab By: *[Signature]* Date: 09/18/20 Time: 1225 Temp (C): 46.0 Meter ID: T-295

Comments: Effluent composite collected in 30 minute intervals from 0700 9-17-20 through 0630 9-18-20. 48 Total Effluent grab samples taken over 24 Hr Effluent composite collection period.

COC Number: A1019206

Page 1 of 1

xx Receiving Water sample collected upstream of Effluent discharge pipe from Nashua River off of McPherson Rd.

Data Appendix Page 29

Ayer Massachusetts WWTF Effluent Evaluation, September 2020
Study Numbers 34500.



Enthalpy Analytical
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345

Enthalpy Job No: 34500

CHAIN OF CUSTODY DOCUMENTATION

Client: Ayer, Ma WWTF	Contact: Paula Boyle	Project Name: Ayer, MA Q3 2020	
Report to: Paula Boyle	Address: Hoyle Tanner & Assoc Inc	Project Number: P0064	Task: 0001
Invoice to: Paula Boyle	Address: Manchester, NH 03101	Project Manager: Paula Boyle	
Voice: 603-669-5555	Fax: 603-669-4168	email: sewer@ayer.ma.us	P.O: '

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
024	Effluent Second Renewal	9-20-20 9-21	0700 0630	TW	C	1	3750	P	4 C	Water	N	CD7DCR 2ndRenewal Sample
025	Effluent Second Renewal	9-20-20 9-21	0700 0630	TW	C	1	250	P	HNO3	Water	N	Total Metals Cd,Ni,Pb,Cu,Zn,Al,Ca,Mg;
026	Effluent Second Renewal	9-20-20 9-21	0700 0630	TW	C	1	40	G	4 C	Water	N	TOC
027	Effluent Second Renewal	9-20-20 9-21	0700 0630	TW	C	1	125	P	4 C	Water	N	Alk
028	Effluent Second Renewal	9-20-20 9-21	0700 0630	TW	C	1	125	P	HNO3	Water	N	Metals Hard;
029	Effluent Second Renewal	9-20-20 9-21	0700 0630	TW	C	1	125	P	H2SO4	Water	N	NH3;
030	Receiving Water Second Renewal	9-21-20	0640	TW	G	1	3750	P	4 C	Water	N	CD7DCR 2ndRenewal Diluent
031	Receiving Water Second Renewal	9-21-20	0640	TW	G	1	125	P	4 C	Water	N	Alk
032	Receiving Water Second Renewal	9-21-20	0640	TW	G	1	125	P	HNO3	Water	N	Metals Hard;
033	Receiving Water Second Renewal	9-21-20	0640	TW	G	1	125	P	H2SO4	Water	N	NH3;

Relinquished By: *[Signature]* Date: 9-21-20 Time: 0700 Received By: *[Signature]* Date: 9-21-20 Time: 7:00 Temp (C): 1.5 Meter ID: 304

Relinquished By: *[Signature]* Date: 9-21-20 Time: 11:40 Received at Lab By: *[Signature]* Date: 09/21/20 Time: 1140 Temp (C): 0.9 Meter ID: T-295

Comments: Effluent composite collected in 30 minute intervals from 0700 9-20-20 through 0630 9-21-20. 48 Total Effluent grab samples taken over 24 Hr. composite collection period.

COC Number: A1019207

Page 1 of 1

** Receiving Water Sample collected upstream of Effluent discharge pipe from Nashua River off of Macpherson Rd.

Data Appendix Page 30

Ayer Massachusetts WWTF Effluent Evaluation, September 2020
Study Numbers 34500.

Assay Review Checklist

DATE IN: 09/16/20 STUDY#: 34500
 DATE DUE: 10/30/20 CLIENT: AYOR
 PROJECT: _____
 ASSAY: CD48AD, CDTDCR

Project Paperwork Check for Completeness				
	Date	Analyst	Supervisor	Comments
Day 0	09/17/20	GRS	GRS	
Day 1	09/18/20	CC		
Day 2	09/19/20	BG		
Day 3	09/20/20	GRS	GRS	
Day 4	09/21/20	GRS	GRS	
Day 5	09/22/20	CME	GRS	
Day 6	09/23/20	CC		
Day 7	09/24/20	GR	GR	
Day 8				

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete	09/24/20	BG	
Sample Receipt Complete		↓	
Organism Culture Sheet(s)		NA	
Bench Sheets Complete (dates, times, initials, etc...)		BG	
Water Quality Data Complete		↓	
TRC Values & Bottle Numbers		↓	
Daphnid Calculations Complete		↓	
Weights Reported		NA	
Assay Acceptability Review	↓	BG	

Technical Report Review	Date	Initials	Comments
Statistical Analysis Complete	9/24/20	MW	
Statistical Analysis Reviewed	10/01/20	JTP	
Data Acceptability Review	9/24/20	MW	
Supporting Chemistry Report	10/1/20	MW	
Draft Report	9/24/20	MW	25 and 50 F echl from report State and RP calculations Key + for surv b/c
QA Audit/Review Complete			
Final Report Reviewed	10/01/20	JTP	
Final Report Printed - PDF	10/5/20	MW	
Executive Summary / Chems Sent			
Report E-mailed / Faxed	10/5/20	MW	
Report Logged Out / Invoice Sent	↓	↓	
Report Scanned to Archive	↓	↓	

Q:\Forms\Lab Forms\Sampling & Receipt\Assay Review Checklist 06-13-19.wpd

Michael J
Salema

Digitally signed by Michael J Salema
 DN: cn=Michael J Salema, o=Enthalpy
 Analytical, ou=QA Director,
 email=msalema@enthalpy.com, c=US
 Date: 2020.06.23 15:36:06 -0400

June 29, 2020

Ms. Paula Boyle
Hoyle, Tanner and Associates Inc.
150 Dow Street
Manchester, New Hampshire 03101

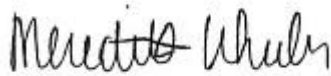
Dear Ms. Boyle:

Enclosed, please find a copy of our report evaluating results of toxicity tests completed on effluent samples collected from the Ayer, Massachusetts Wastewater Treatment Facility in June 2020. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

Please do not hesitate to call me should you have any questions regarding the report.

Sincerely,

Enthalpy Analytical, LLC



Meredith Wheeler
Project Manager

Enclosure

WET Test Report Certification
Report 34144-20-06
Email Only

Cc: Rick Hudson

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION

Permittee Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on:

Authorized Signature

Print or Type Name

Town of Ayer Board of Selectmen
Print or Type the Permittee's Name

MA0100013
Type or Print the NPDES Permit No.

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION (Bioassay Laboratory)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: June 29, 2020



Kirk Cram
Laboratory Director - Enthalpy Analytical, LLC



**TOXICOLOGICAL EVALUATION
OF A TREATED MUNICIPAL EFFLUENT
BIOMONITORING SUPPORT FOR A NPDES PERMIT:
June 2020**

Ayer Wastewater Treatment Facility
Ayer, Massachusetts
NPDES Permit Number MA0100013

Prepared For:

Hoyle, Tanner and Associates Inc.
150 Dow Street
Manchester, New Hampshire 03101

Prepared By:

Enthalpy Analytical, LLC
One Lafayette Road
Hampton, New Hampshire 03842

June 2020
Reference Number: Ayer34144-20-06

STUDY NUMBER 34144

EXECUTIVE SUMMARY

The following summarizes the results of acute and chronic exposure bioassays performed during June 2020 using samples collected from the Ayer, Massachusetts Wastewater Treatment Facility. Samples were provided by Civil and Environmental Consultants, Inc., Raynham, Massachusetts. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

C. dubia, cultured at Enthalpy, were <24 hours old juveniles. Dilution water was receiving water collected from the Nashua River upstream of the discharge. Samples were received under chain of custody in good order. All sample receipt, test conditions and control endpoints were within protocol specifications, except where otherwise noted.

The results presented in this report relate only to the samples described on the chain(s) of custody and sample receipt log(s), and are to be used only by the submitter. Results from the chronic and modified acute exposure assays and their relationship to permit limits are summarized in the following matrix.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Effluent Meets Permit Limit	Assay Meets Protocol Limits
<i>Ceriodaphnia dubia</i> ^a	48 Hours	>100%	NC	≥100%	Yes	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	IC-25	Permit Limit (C-NOEC)	Effluent Meets Permit Limit	Assay Meets Protocol Limits
<i>Ceriodaphnia dubia</i>	7 Days	50%	53.5%	≥7.7%	Yes	Yes

COMMENTS:

NC = Not Calculated.

^a Four daphnids were found in replicate D of the 100% test concentration on day 1, therefore 4 organisms will be used from initiation of the assay for data summary purposes.

**TOXICOLOGICAL EVALUATION
OF A TREATED MUNICIPAL EFFLUENT
BIOMONITORING SUPPORT FOR A NPDES PERMIT:
June 2020**

Ayer Wastewater Treatment Facility
Ayer, Massachusetts
NPDES Permit Number MA0100013

1.0 INTRODUCTION

This report presents the results of toxicity tests completed on a series of composite effluent samples collected from the Ayer, Massachusetts Wastewater Treatment Facility (Ayer WWTF). Samples were provided by Civil and Environmental Consultants, Inc., Raynham, Massachusetts. Testing was based on programs and protocols developed by the US EPA (2002), with exceptions as noted by US EPA Region I (2011, 2013), and involved conducting acute and chronic toxicity tests with the daphnid, *Ceriodaphnia dubia*. Testing was conducted at Enthalpy Analytical, LLC (Enthalpy), Hampton, New Hampshire in accordance with the provisions of TNI Standards (2009).

Acute toxicity tests involve preparing a series of test concentrations by diluting effluent with control water. Groups of test organisms are exposed to each test concentration and control for a specified period. The mortality data for each concentration can be used to calculate the median lethal concentration or LC-50, defined as the concentration of effluent that kills half of the test organisms. Samples with a high LC-50 value are less likely to cause significant environmental impacts. These data can also be analyzed to determine the no effect level. This Acute No Observed Effect Concentration (A-NOEC) is defined as the highest tested effluent concentration that causes no significant mortality. Chronic toxicity tests measure sublethal effects, exposing test organisms to samples during a sensitive period in the life cycle. Daphnid chronic tests measure survival and juvenile production. Using Analysis of Variance techniques to evaluate the data, it is possible to determine the lowest tested concentration that had an effect (C-LOEC) and the highest tested concentration where no effect (C-NOEC) was observed. An Inhibition Concentration (IC) may be calculated by linear interpolation to confirm the C-NOEC in situations where a non-standard dose-response or sample toxicity are encountered. The IC-25 is calculated to best approximate the C-NOEC (US EPA 2000).

2.0 MATERIALS AND METHODS

2.1 General Methods

Toxicological and analytical protocols used in this program follow procedures primarily designed to provide standard approaches for the evaluation of toxicological effects of discharges on aquatic organisms (US EPA 2002), and for the analysis of water samples (APHA 2012). See Section 4.0 for a list of references.

2.2 Test Species

C. dubia were maintained in laboratory water at 25±1°C with a photoperiod of 16:8 hours light:dark. Cultures are fed daily with a yeast/trout chow/Cerophyll or alfalfa leaves (YTC) mixture supplemented with *Pseudokirchneriella subcapitata* (algae) (US EPA 2002). Adults on a brood board were isolated 24 hours prior to test start. Daphnids used in the chronic assay were allowed to reproduce for 8 hours.

2.3 Effluent, Receiving Water, and Laboratory Water

Effluent and receiving water collection information is provided in Table 1. Samples were received at 0-6°C as per 40 CFR §136.3 unless otherwise noted, stored at 4±2°C and warmed to 25±1°C prior to preparing test solutions. Laboratory water was synthetic reconstituted water prepared at Enthalpy according to protocol (US EPA 2002). This water has been used to successfully culture freshwater organisms since 1992.

Total residual chlorine (TRC) was measured by amperometric titration (MDL 0.02 mg/L) in the effluent samples prior to use in the assays. Samples with ≥ 0.02 mg/L TRC were dechlorinated using sodium thiosulfate (US EPA 2002) and a control treatment using laboratory water adjusted with the same amount of sodium thiosulfate used to dechlorinate the effluent was run concurrently with the assay. If sample pH measured < 6.0 SU or > 9.0 SU, samples were adjusted using sodium hydroxide or hydrochloric acid, respectively, and a control treatment using laboratory water adjusted with the same amount of either compound used to modify sample pH was run concurrently with the assay. When applicable, data from sodium thiosulfate and/or pH adjusted laboratory control treatments can be found in Appendix A.

2.4 Acute Exposure Bioassay

The 48-hour static acute assay was conducted at $25 \pm 1^\circ\text{C}$ with a photoperiod of 16:8 hours light:dark. Test concentrations were 100% (undiluted), 50%, 25%, 12.5%, and 6.25% effluent. Daphnids were maintained in 30 mL test chambers with approximately 20 mL of test solution in each of 4 replicates with 5 organisms/replicate. Test organisms were derived from a pool of mixed organisms recovered from Enthalpy's culture the morning of testing. All organisms used were recovered from the same type of culture water.

Survival in all test replicates was recorded daily. A fifth replicate was included as a surrogate test chamber to obtain daily water qualities without disturbing the test animals, and was treated the same as actual test chambers with the addition of animals and food, but was not used to determine endpoint data. Dissolved oxygen, pH and temperature were measured daily, and specific conductivity was measured at the start of the assay.

2.5 Chronic Exposure Bioassay

The chronic exposure bioassay was conducted according to protocol (US EPA 2002), which called for the daily renewal of test solutions. Test treatments for the assay were 100% (undiluted), 50%, 25%, 12.5%, 7.7%, and 6.25% effluent. Dissolved oxygen, pH, specific conductivity and temperature were measured in one replicate of each new and old test solution.

Test chambers for the daphnid assay were 30 mL portion cups containing approximately 20 mL of test solution in each of 10 replicates with 1 organism/replicate. Replicates were not randomized during testing; rather, organisms were added at test initiation by blocking by known parentage. Survival and juvenile production were monitored daily. Daphnids were each fed 200 μL of a mixture of YTC and algae after daily renewals.

2.6 Data Analysis

Statistical analysis of acute and chronic exposure data was completed using CETIS™ v1.9.6.3, Comprehensive Environmental Toxicity Information System, software. The program computes acute and chronic exposure endpoints based on US EPA decision tree guidelines specified in individual test methods. If survival in the highest test concentration is $> 50\%$, the LC-50 is obtained by direct observation of the raw data. As needed, the A-NOEC is determined as the highest test concentration that caused no significant mortality. For chronic exposure endpoints statistical significance was accepted at $\alpha = 0.05$. For statistical calculations of *C. dubia* juvenile production, data from only the first three broods are used.

2.7 Quality Control

As part of the laboratory quality control program, reference toxicant evaluations are completed on a regular basis for each test species. These results provide regular laboratory performance evaluation through the comparison of historic data sets. See Table 2 for details.

3.0 RESULTS AND DISCUSSION

Results of the acute exposure assay completed using *C. dubia* are presented in Table 3, and chronic results can be found in Table 4. Water quality data collected during the assays are summarized in Table 5. US EPA Region I Attachment F toxicity test summary sheets are provided after the tables. Support data, including copies of laboratory bench sheets, are provided in Appendix A.

3.1 Acute Exposure Bioassay

Minimum test acceptability criteria require $\geq 90\%$ survival in the control concentrations. Achievement of these results indicates that healthy test organisms were used and that the dilution water had no significant adverse impact on the outcome of the assay. See the Executive Summary and Table 3 for test acceptability.

3.2 Chronic Exposure Bioassay

Minimum test acceptability criteria require 80% control survival, mean reproduction of 15 juveniles/female, production of 3 broods by at least 60% of control females, and the MSDp for reproduction to be 13-47% for *Ceriodaphnia dubia* (US EPA 2002). Achievement of these results indicates that healthy test organisms were used and that the dilution water had no significant adverse impact on the outcome of the assay. See the Executive Summary and Table 4 for test acceptability.

4.0 LITERATURE CITED

- 40 CFR §136.3. *Code of Federal Regulations* (CFR), Protection of the Environment (Title 40), Guidelines Establishing Test Procedures for the Analysis of Pollutants (Part 136), Identification of Test Procedures (sub-part 3), Table II-Required Containers, Preservation Techniques, and Holding Times.
- APHA. 2012. *Standard Methods for the Examination of Water and Wastewater*, 22nd Edition. Washington D.C.
- The NELAC Institute (TNI). 2009. *Environmental Laboratory Sector, Volume 1: Management and Technical Requirements for Laboratories Performing Environmental Analysis (TNI Standard)*. EL-V1-2009.
- US EPA. 2000. *Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing (40 CFR Part 136)*. EPA 821-B-00-004.
- US EPA. 2002. *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms*. Fifth Edition. EPA-821-R-02-012.
- US EPA. 2002. *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*. Fourth Edition. EPA-821-R-02-013.
- US EPA Region I. 2011. *US EPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol*. US EPA Region I Office, Boston, Massachusetts. February 28, 2011.
- US EPA Region I. 2013. *Freshwater Chronic Toxicity Test Procedure and Protocol - US EPA Region I*. US EPA Region I Office, Boston, Massachusetts. December 2013.

**TABLE 1. Sample Collection Information. Evaluation. June 2020.
Ayer WWTF Effluent Evaluation. June 2020.**

Sample Description	Type	Collection		Receipt		Receipt Temp °C
		Date	Time	Date	Time	
EFFLUENT						
Start	Comp	06/09-10/20	0745-0715	06/10/20	0855	4
First Renewal	Comp	06/11-12/20	0700-0630	06/12/20	0940	3
Second Renewal	Comp	06/14-15/20	0700-0630	06/15/20	0815	2
RECEIVING WATER						
Start	Grab	06/10/20	0745	06/10/20	0855	4
First Renewal	Grab	06/12/20	0710	06/12/20	0940	3
Second Renewal	Grab	06/15/20	0805	06/15/20	0815	2

**TABLE 2. *C. dubia* Reference Toxicant Data.
Ayer WWTF Effluent Evaluation. June 2020.**

Date	Organism Lot	Endpoint	Value	Historic Mean/ Tendency	Acceptable Range	Reference Toxicant
<i>C. dubia</i>						
06/02/20	00CdEAH060220	Survival: LC-50	42.5	28.5	12.7 – 44.4	SDS (mg/L)
06/02/20	00CdEAH060220	Survival: C-NOEC	30.0	30.0	15.0 – 60.0	Copper (µg/L)
06/02/20	00CdEAH060220	Reproduction: C-NOEC	30.0	15.0	7.5 – 30.0	Copper (µg/L)
06/02/20	00CdEAH060220	Reproduction: MSDp	28.0	29.6	11.5 – 47.6	Copper (µg/L)

Means and Acceptable Ranges based on the 20 most recent reference toxicant assays.

**TABLE 3. *C. dubia* Acute Exposure Assay Data Summary.
Ayer WWTF Effluent Evaluation. June 2020.**

Species	Exposure	LAB	Percent Survival					
			RW	6.25%	12.5%	25%	50%	100% ^a
<i>C. dubia</i>	48 Hours	100%	100%	100%	100%	100%	100%	94.7%
Species	Exposure	LC-50 and A-NOEC Results				Direct Observation	A-NOEC	
		Spearman- Karber	Linear Interpolation					
<i>C. dubia</i>	48 Hours	NC	NC			>100%	NC	

COMMENTS:

NC = Not Calculated.

RW = Receiving Water; used as the diluent.

^a Four daphnids were found in replicate D of the 100% test concentration on day 1, therefore 4 organisms will be used from initiation of the assay for data summary purposes.

**TABLE 4. *C. dubia* Chronic Exposure Assay Data Summary.
Ayer WWTF Effluent Evaluation. June 2020.**

Effluent Conc.	Mean Percent Survival	Mean Reproduction	% Females Producing 3	Is There a Significant Difference Based on	
	Day 7	(Juv/Female)	Broods	Survival (%)	Reproduction
LAB	100%	29.9	100%	-	-
RW	100%	36.3	100%	-	-
6.25%	100%	31.1	70%	No	No
7.7%	100%	28.9	80%	No	No
12.5%	100%	27.3	70%	No	No
25%	100%	29.3	80%	No	No
50%	100%	29.2	70%	No	No
100%	100%	14.5	40%	No	Yes

MSDp = 27.0%

NOEC = 100%

NOEC = 50%

IC-25 = 53.5%

COMMENTS:

RW = Receiving Water; used as the diluent.

**TABLE 5. WET Support Chemistry Data.
Ayer WWTF Effluent Evaluation. June 2020.**

PARAMETER	UNITS	EFFLUENT	RECEIVING WATER
Specific Conductivity	µmhos/cm	1372	334
pH	SU	7.83	6.99
Total Residual Chlorine	mg/L	<0.02	-
Alkalinity	mg/L	260	23
Hardness	mg/L	210	43
Total Solids	mg/L	790	-
Total Dissolved Solids	mg/L	880	-
Ammonia	mg/L as N	0.34	<0.1
Total Organic Carbon	mg/L	6.8	4.1
Aluminum, total	mg/L	0.037	0.079
Cadmium, total	mg/L	<0.0003	<0.0003
Calcium, total	mg/L	68.7	13.3
Copper, total	mg/L	0.0031	0.0027
Lead, total	mg/L	<0.0003	0.0017
Magnesium, total	mg/L	11.5	2.47
Nickel, total	mg/L	0.0035	0.0012
Zinc, total	mg/L	0.034	0.0055

COMMENTS:

Additional water quality and analytical support data are provided in Appendix A.

TOXICITY TEST SUMMARY SHEET

FACILITY NAME:	Ayer WWTF	TEST START DATE:	06/11/20
NPDES PERMIT NO.:	MA0100013	TEST END DATE:	06/13/20

TEST TYPE	TEST SPECIES	SAMPLE TYPE	SAMPLE METHOD
<input checked="" type="checkbox"/> Acute	<input type="checkbox"/> <i>Pimephales promelas</i>	<input type="checkbox"/> Prechlorinated	<input type="checkbox"/> Grab
<input type="checkbox"/> Chronic	<input checked="" type="checkbox"/> <i>Ceriodaphnia dubia</i>	<input type="checkbox"/> Dechlorinated	<input checked="" type="checkbox"/> Composite
<input type="checkbox"/> Modified Chronic (Reporting Acute Values)	<input type="checkbox"/> <i>Daphnia pulex</i>	<input type="checkbox"/> Chlorine Spiked in Lab	<input type="checkbox"/> Flow-thru
<input type="checkbox"/> 24 Hour Screen	<input type="checkbox"/> <i>Americamysis bahia</i>	<input type="checkbox"/> Chlorinated on Site	<input type="checkbox"/> Other
	<input type="checkbox"/> <i>Cyprinodon variegatus</i>	<input type="checkbox"/> Unchlorinated	
	<input type="checkbox"/> <i>Menidia beryllina</i>	<input checked="" type="checkbox"/> No Detectable Chlorine Upon Receipt	
	<input type="checkbox"/> <i>Arbacia punctulata</i>		

DILUTION WATER:

☒ Receiving water collected at a point upstream or away from the discharge, free from toxicity or other sources of contamination; Receiving Water Name: Nashua River

☐ Alternate surface water of known quality and hardness, to generally reflect the characteristics of the receiving water; Receiving Water Name: _____

☐ Synthetic water prepared using either Millipore Milli-Q or equivalent deionized water and reagent grade chemicals; or deionized water combined with mineral water.

☐ Artificial sea salts mixed with deionized water

☐ Deionized water and hypersaline brine

☐ Other _____

EFFLUENT SAMPLING DATES: 06/09-10/20

EFFLUENT CONCENTRATIONS TESTED (%): 100, 50, 25, 12.5, 6.25

Permit Limit Concentration: ≥100% %

Was the effluent salinity adjusted? No If yes, to what level? - ppt

REFERENCE TOXICANT TEST DATE: 06/02/20 LC-50: 42.5 mg/L Sodium Dodecyl Sulfate

PERMIT LIMITS AND TEST RESULTS

Test Acceptability Criteria

Mean Diluent Control Survival: 100 %

LIMITS

LC-50: 100 %

A-NOEC: - %

RESULTS

LC-50 >100 %

Upper Limit: - %

Lower Limit: - %

Method: Direct Observation

A-NOEC - %

TOXICITY TEST SUMMARY SHEET

FACILITY NAME:	<u>Ayer WWTF</u>	TEST START DATE:	<u>06/11/20</u>
NPDES PERMIT NO.:	<u>MA0100013</u>	TEST END DATE:	<u>06/18/20</u>

TEST TYPE	TEST SPECIES	SAMPLE TYPE	SAMPLE METHOD
<input type="checkbox"/> Acute	<input type="checkbox"/> <i>Pimephales promelas</i>	<input type="checkbox"/> Prechlorinated	<input type="checkbox"/> Grab
<input checked="" type="checkbox"/> Chronic	<input checked="" type="checkbox"/> <i>Ceriodaphnia dubia</i>	<input type="checkbox"/> Dechlorinated	<input checked="" type="checkbox"/> Composite
<input type="checkbox"/> Modified Chronic (Reporting Acute Values)	<input type="checkbox"/> <i>Daphnia pulex</i>	<input type="checkbox"/> Chlorine Spiked in Lab	<input type="checkbox"/> Flow-thru
<input type="checkbox"/> 24 Hour Screen	<input type="checkbox"/> <i>Americamysis bahia</i>	<input type="checkbox"/> Chlorinated on Site	<input type="checkbox"/> Other
	<input type="checkbox"/> <i>Cyprinodon variegatus</i>	<input type="checkbox"/> Unchlorinated	
	<input type="checkbox"/> <i>Menidia beryllina</i>	<input checked="" type="checkbox"/> No Detectable Chlorine Upon Receipt	
	<input type="checkbox"/> <i>Arbacia punctulata</i>		

DILUTION WATER:

☒ Receiving water collected at a point upstream or away from the discharge, free from toxicity or other sources of contamination; Receiving Water Name: Nashua River

☐ Alternate surface water of known quality and hardness, to generally reflect the characteristics of the receiving water; Receiving Water Name: _____

☐ Synthetic water prepared using either Millipore Milli-Q or equivalent deionized water and reagent grade chemicals; or deionized water combined with mineral water.

☐ Artificial sea salts mixed with deionized water

☐ Deionized water and hypersaline brine

☐ Other _____

EFFLUENT SAMPLING DATES: 06/09-10/20 06/11-12/20 06/14-15/20

EFFLUENT CONCENTRATIONS TESTED (%): 100, 50, 25, 12.5, 7.7, 6.25

Permit Limit Concentration: ≥7.7 %

Was the effluent salinity adjusted? No If yes, to what level? - ppt

REFERENCE TOXICANT TEST DATE: 06/02/20 NOEC: 30.0 µg/L Copper

PERMIT LIMITS AND TEST RESULTS

Test Acceptability Criteria

Mean Diluent Control Survival: <u>100</u> %	Mean # Juveniles/Female: <u>36.3</u>
	MSDp <u>27.0</u> %

LIMITS

C-NOEC: ≥7.7 %

IC - - %

RESULTS

C – NOEC: 50 %

C – LOEC: 100 %

IC - 25 53.5 %

APPENDIX A
DATA SHEETS
STATISTICAL SUPPORT

Contents	Number of Pages
Methods Used in NPDES Permit Biomonitoring Testing	1
Massachusetts DEP Accreditation Certification and Certified Parameter List	2
<u>Acute Exposure Bioassay</u>	
<i>C. dubia</i> Acute Bioassay Bench Sheet	1
<i>C. dubia</i> Acute Reference Toxicant Analysis	1
<u>Chronic Exposure Bioassay</u>	
<i>C. dubia</i> Chronic Reproduction Assay Bench Sheets	2
<i>C. dubia</i> Reference Toxicant Analysis	3
<i>C. dubia</i> Survival and Reproduction Statistical Analysis	8
<i>C. dubia</i> Blocking by Parentage Tracking Sheet	1
Water Quality Bench Sheets	2
Preparation of Dilutions and Record of Meters Used	4
Analytical Chemistry Support Data Summary Report	2
Sample Receipt Record	1
Chain of Custody	4
Assay Review Checklist	1
 Total Appendix Pages	 33

METHODS USED IN NPDES PERMIT BIOMONITORING TESTING

Parameter	Method
Acute Exposure Bioassays:	
<i>Ceriodaphnia dubia</i>	EPA-821-R-02-012 2002.0
<i>Daphnia pulex</i>	EPA-821-R-02-012 2021.0
<i>Pimephales promelas</i>	EPA-821-R-02-012 2000.0
<i>Americamysis bahia</i>	EPA-821-R-02-012 2007.0
<i>Menidia beryllina</i>	EPA-821-R-02-012 2006.0
<i>Cyprinodon variegatus</i>	EPA-821-R-02-012 2004.0
Chronic Exposure Bioassays:	
<i>Ceriodaphnia dubia</i>	EPA-821-R-02-013 1002.0
<i>Pimephales promelas</i>	EPA-821-R-02-013 1000.0
<i>Cyprinodon variegatus</i>	EPA-821-R-02-014 1004.0
<i>Menidia beryllina</i>	EPA-821-R-02-014 1006.0
<i>Arbacia punctulata</i>	EPA-821-R-02-014 1008.0
<i>Champia parvula</i>	EPA-821-R-02-014 1009.0
Trace Metals:	
Trace Metals	EPA 200.8/SW 6020, EPA 245.7
Hardness	EPA SW846 3rd Ed. 6010
Wet Chemistries:	
Alkalinity	EPA 310.2
Chlorine, Residual	Standard Methods 22 nd Edition - Method 4500-Cl D
Total Organic Carbon	Standard Methods 22 nd Edition - Method 5310 C
Specific Conductance	Standard Methods 22 nd Edition - Method 2510 B
Nitrogen - Ammonia	Standard Methods 22 nd Edition - Method 4500-NH ₃ G
pH	Standard Methods 22 nd Edition - Method 4500-H+ B
Solids, Total (TS)	Standard Methods 22 nd Edition - Method 2540 B
Solids, Total Dissolved (TDS)	Standard Methods 22 nd Edition - Method 2540 C
Solids, Total Suspended (TSS)	Standard Methods 22 nd Edition - Method 2540 D
Dissolved Oxygen	Standard Methods 22 nd Edition - Method 4500-O G

Please visit our web site at www.enthalpy.com/accreditations for a copy of our accreditations and state certifications.

The Commonwealth of Massachusetts



Department of Environmental Protection

Division of Environmental Laboratory Sciences

Senator William X. Wall Experiment Station

certifies

M-NH906

ENTHALPY ANALYTICAL, LLC
1 LAFAYETTE RD
UNIT 6
HAMPTON, NH 03842-0000

Laboratory Director: JASON HOBBS

for the analysis of NON POTABLE WATER (CHEMISTRY)

pursuant to 310 CMR 42.00

This certificate supersedes all previous Massachusetts certificates issued to this laboratory. The laboratory is regulated by and shall be responsible for being in compliance with Massachusetts regulations at 310 CMR 42.00.

This certificate is valid only when accompanied by the latest dated Certified Parameter List as issued by the Massachusetts D.E.P. Contact the Division of Environmental Laboratory Sciences to verify the current certification status of the laboratory.

Certification is no guarantee of the validity of the data. This certification is subject to unannounced laboratory inspections.

A handwritten signature in black ink, reading "Oscar C. Parcells".

Director, Division of Environmental Laboratory Sciences

Issued: 01 JUL 2020

Expires: 30 JUN 2021

**COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

Certified Parameter List as of: 01 JUL 2020

**M-NH906 ENTHALPY ANALYTICAL, LLC
HAMPTON NH**

NON POTABLE WATER (CHEMISTRY)	Effective Date	01 JUL 2020	Expiration Date	30 JUN 2021
<u>Analytes</u>			<u>Methods</u>	
ALUMINUM			EPA 200.8	
ANTIMONY			EPA 200.8	
ARSENIC			EPA 200.8	
BERYLLIUM			EPA 200.8	
CADMIUM			EPA 200.8	
CHROMIUM			EPA 200.8	
COBALT			EPA 200.8	
COPPER			EPA 200.8	
IRON			EPA 200.8	
LEAD			EPA 200.8	
MANGANESE			EPA 200.8	
MERCURY			EPA 245.7	
MOLYBDENUM			EPA 200.8	
NICKEL			EPA 200.8	
SELENIUM			EPA 200.8	
SILVER			EPA 200.8	
THALLIUM			EPA 200.8	
VANADIUM			EPA 200.8	
ZINC			EPA 200.8	
PH			SM 4500-H-B	
SPECIFIC CONDUCTIVITY			SM 2510B	
TOTAL DISSOLVED SOLIDS			SM 2540C	
ALKALINITY, TOTAL			EPA 310.2	
AMMONIA-N			SM 4500-NH3-B, G	
NITRATE-N			SM 4500-NO3-F	
ORTHOPHOSPHATE			SM 4500-P-E	
PHOSPHORUS, TOTAL			SM 4500-P-B,E	
BIOCHEMICAL OXYGEN DEMAND			SM 5210B	
NON-FILTERABLE RESIDUE			SM 2540D	
OIL AND GREASE			EPA 1664	

June 1, 2020

*= Provisional Certification

Page 1 of 1

DAPHNID ACUTE DEFINITIVE ASSAY

STUDY: 34144

CLIENT: Ayer

SAMPLE: Effluent

DILUENT: Receiving Water

SPECIES: *C. dubia*

LOT ID: 00CJFAH061120

AGE: <24 Hours

Treatment	Rep	SURVIVAL			DO (mg/L)			pH (SU)			Temp (°C)			S/C (µmhos/cm)	Sample Chemistries	
		0	24	48	0	24	48	0	24	48	0	24	48	0		
Lab	Surr.	5	5	5	8.6	8.8	8.9	7.98	7.90	8.27	23	23	21	203	T. Metals:	002
	A	5	5	5											TOC:	003
	B	5	5	5											Alk.:	004
	C	5	5	5											Hard.:	005
	D	5	5	5											NH3:	006
Receiving Water	Surr.	5	4	4	9.9	9.2	9.0	7.04	7.85	8.19	24	23	21	330	TS/TDS:	007
	A	5	5	5		8.8									Batch Used	
	B	5	5	5												
	C	5	5	5											Selenastrum :	
	D	5	5	5												
6.25%	Surr.	5	5	5	9.6	8.8	9.1	7.19	7.91	8.34	24	23	21	395	YCT:	F142
	A	5	5	5												
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
12.5%	Surr.	5	5	5	9.6	8.8	9.1	7.34	8.01	8.42	24	23	21	457		
	A	5	5	5												
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
25%	Surr.	5	5	5	9.5	8.9	9.1	7.56	8.22	8.58	23	23	21	600		
	A	5	5	5												
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
50%	Surr.	5	5	5	9.3	8.9	9.2	7.76	8.50	8.74	24	23	21	858		
	A	5	5	5												
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
100%	Surr.	5	5	5	9.5	9.0	9.2	7.86	8.66	8.86	24	23	21	1361		
	A	5	5	4												
	B	5	5	5												
	C	5	5	5												
	D	5	4	4												
INC TEMP (°C)		25	25	25											E10 B6 06/12 only 4 live organisms; no local organism found. E11 MW 6/12 using 4 from start for survival summary purposes.	
DATE		06/11/20	06/12/20	06/13/20	06/11/20	06/12	06/13									
TIME		0955	1115	0940	0850	1025	0945									
INITIALS		CMC	BG	BG	GRS	CFS	CFS									

STANDARD REFERENCE TOXICANT ANALYSIS

Exposure: Acute - 48 Hours

Species: *Ceriodaphnia dubia*

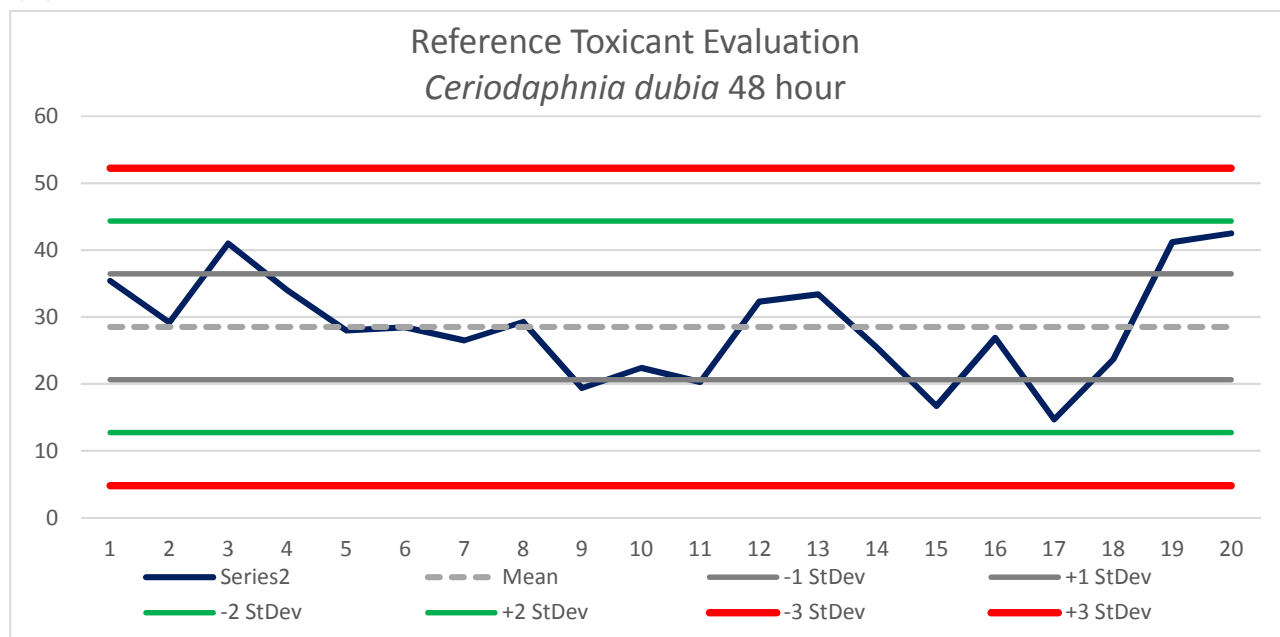
Toxicant: SDS

Temperature: 25C

Long Term Mean: 28.54 mg/L SDS

Long Term CV: 28%

Date		LC-50	Mean	Std Dev	2 Std Dev	CV	Mean -1 Std	Mean +1 Std	Mean -2 Std	Mean +2 Std	Mean -3 Std	Mean +3 Std
12/4/2018	1	35.4	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26
1/15/2019		29.2	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26
2/19/2019		41	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26
3/19/2019		34	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26
4/23/2019	5	28	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26
4/30/2019		28.5	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26
6/4/2019		26.5	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26
6/26/2019		29.3	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26
7/25/2019		19.4	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26
8/1/2019	10	22.4	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26
9/5/2019		20.3	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26
10/1/2019		32.3	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26
11/21/2019		33.4	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26
12/3/2019		25.4	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26
1/23/2020	15	16.7	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26
2/20/2020		26.9	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26
3/25/2020		14.7	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26
4/22/2020		23.7	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26
5/27/2020		41.2	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26
6/2/2020	20	42.5	28.54	7.91	15.81	27.70	20.63	36.45	12.73	44.35	4.82	52.26



Issued by:

Reviewed by:

Ayer Massachusetts WWTF Effluent Evaluation, June 2020.
Study Numbers 34144.

Data Appendix Page 5

Ceriodaphnia dubia CHRONIC REPRODUCTION ASSAY

Ceriodaphnia dubia CHRONIC REPRODUCTION ASSAY														
STUDY # 34144	CONC.	DAY	A	B	C	D	E	F	G	H	I	J	SUM	SURV.
CLIENT: AYER WWTF	MSR	0	+	+	+	+	+	+	+	+	+	+	0	10
		1	+	+	+	+	+	+	+	+	+	+	0	10
		2	+	+	+	+	+	+	+	+	+	+	0	10
		3	+	5	+	+	+	+	+	6	3	5	19	10
		4	4	+	6	6	5	4	8	+	+	+	33	10
		5	9	9	11	10	11	+	12	9	10	10	91	10
		6	+	15	+	+	+	10	13	25	15	10	88	10
		7	3	+	20	13	14	18	+	+	15	13	68	10
		8												
	TOTAL	16	29	37	29	30	32	33	40	28	25	299	10	
DILUENT: Receiving Water	RW	0	+	+	+	+	+	+	+	+	+	+	0	10
		1	+	+	+	+	+	+	+	+	+	+	0	10
		2	+	+	+	+	+	+	+	+	+	+	0	10
		3	+	4	+	+	+	+	+	5	6	+	15	10
		4	7	+	6	7	5	5	5	+	+	+	35	10
		5	+	12	7	8	9	+	5	9	15	12	77	10
		6	12	20	+	+	+	10	+	19	15	17	93	10
		7	23	3	25	14	21	23	16	+	12	18	143	10
		8												
	TOTAL	42	39	38	29	35	38	26	33	36	47	363	10	
Cerio Data source: MSR <input checked="" type="checkbox"/> MHR <input checked="" type="checkbox"/> collected: previous pm <input type="checkbox"/> test day am <input checked="" type="checkbox"/>	6.25%	0	+	+	+	+	+	+	+	+	+	+	0	10
		1	+	+	+	+	+	+	+	+	+	+	0	10
		2	+	+	+	+	+	+	+	+	+	+	0	10
		3	+	6	+	+	3	+	+	+	5	+	14	10
		4	4	+	7	6	+	7	+	+	+	+	24	10
		5	10	12	9	11	1	+	16	8	9	11	87	10
		6	+	5	+	+	+	16	+	11	13	17	62	10
		7	13	+	22	17	13	23	19	+	11	17	124	10
		8					CS MTD 6/19							
	TOTAL	27	23	38	34	15	46	35	19	27	45	311	10	
LEGEND: + = LIVE - = DEAD ♂ = MALE M = MISSING Calculations: Initials: MW Date: 6/19/20	7.7%	0	+	+	+	+	+	+	+	+	+	+	0	10
		1	+	+	+	+	+	+	+	+	+	+	0	10
		2	+	+	+	+	+	+	+	+	+	+	0	10
		3	+	+	+	+	+	+	+	5	3	+	8	10
		4	3	+	6	4	4	4	8	+	+	+	29	10
		5	8	11	5	10	8	+	8	11	10	10	81	10
		6	+	20	+	+	+	9	+	13	13	+	55	10
		7	13	1	20	16	24	22	20	+	15	+	116	10
		8												
	TOTAL	24	32	31	30	36	35	36	29	26	10	289	10	

100%

100%

70%

80%

Ceriodaphnia dubia CHRONIC REPRODUCTION ASSAY

STUDY #	CONC.	DAY	A	B	C	D	E	F	G	H	I	J	SUM	SURV.
34144		0	+	+	+	+	+	+	+	+	+	+	0	10
CLIENT: AYER WWTF		1	+	+	+	+	+	+	+	+	+	+	0	10
SAMPLE: Effluent		2	+	+	+	+	+	+	+	+	+	+	0	10
DILUENT: Receiving Water	12.5%	3	+	+	+	+	+	+	+	5	3	5	13	10
Cerio Data source: MSR <input checked="" type="checkbox"/> MHR <input checked="" type="checkbox"/> collected: previous pm <input type="checkbox"/> test day am <input checked="" type="checkbox"/>		4	+	+	4	5	5	2	1	+	+	+	17	10
		5	12	11	6	8	11	+	5	11	10	11	85	10
		6	+	23	+	+	+	9	+	15	13	14	74	10
		7	12	3	11	11	15	21	11	+	14	16	84	10
		8												
		TOTAL	24	37	21	24	31	32	17	31	26	30	273	10
DAY 0 06/11/20 TIME: 1445 FED: CMC		0	+	+	+	+	+	+	+	+	+	+	0	10
DAY 1 06/12/20 TIME: 1410 FED: MW		1	+	+	+	+	+	+	+	+	+	+	0	10
DAY 2 06/13/20 TIME: 1310 FED: BG		2	+	+	+	+	+	+	+	+	+	+	0	10
DAY 3 06/14/20 TIME: 1255 FED: GRS	25%	3	+	5	+	+	+	+	+	5	4	5	19	10
DAY 4 06/15/20 TIME: 1255 FED: CMC		4	+	+	4	3	6	3	8	+	+	+	24	10
DAY 5 06/16/20 TIME: 1540 FED: CFS		5	+	10	5	10	5	2	9	7	10	8	66	10
DAY 6 06/17/20 TIME: 1335 FED: W		6	+	20	+	+	+	+	+	21	7	19	57	10
DAY 7 06/18/20 TIME: 1440 FED: PES		7	7	+	23	14	23	6	26	+	19	15	127	10
DAY 8		8										2 mms 6/19		
		TOTAL	7	35	32	27	34	11	37	33	40	38	293	10
LEGEND: + = LIVE - = DEAD ♂ = MALE M = MISSING Calculations: Initials: MW Date: 6/19/20		0	+	+	+	+	+	+	+	+	+	+	0	10
		1	+	+	+	+	+	+	+	+	+	+	0	10
		2	+	+	+	+	+	+	+	+	+	+	0	10
		3	+	7	+	+	+	+	+	4	+	+	8	10
		4	3	+	6	7	+	+	6	+	+	+	22	10
		5	6	7	9	7	10	6	13	10	10	2	80	10
		6	+	21	+	+	+	12	+	17	14	+	64	10
		7	15	+	19	15	23	+	25	+	16	5	118	10
		8												
		TOTAL	24	32	34	29	33	18	44	31	40	7	292	10
		0	+	+	+	+	+	+	+	+	+	+	0	10
		1	+	+	+	+	+	+	+	+	+	+	0	10
		2	+	+	+	+	+	+	+	+	+	+	0	10
		3	+	7	+	+	+	+	+	3	+	3	13	10
		4	+	+	+	+	+	5	6	+	+	+	11	10
		5	+	+	10	+	+	8	8	4	8	6	36	10
		6	+	+	+	+	+	+	8	12	16	+	36	10
		7	2	14	3	+	+	8	+	+	13	9	49	10
		8												
		TOTAL	2	21	13	0	0	13	22	19	37	18	145	10

10%

80%

10%

40%

STANDARD REFERENCE TOXICANT ANALYSIS

Exposure: 7 day Chronic

Species: Ceriodaphnia dubia

Toxicant: Copper - ug/L

Endpoint: Survival

DATE		C-NOEC	Mean	Std Dev	CV	CT	-1 Conc	+1 Conc
12/12/2018	1	30	25.50	7.05	27.66	30	15	60
1/15/2019	2	30	25.50	7.05	27.66	30	15	60
2/19/2019	3	30	25.50	7.05	27.66	30	15	60
3/19/2019	4	30	25.50	7.05	27.66	30	15	60
4/23/2019	5	15	25.50	7.05	27.66	30	15	60
4/30/2019	6	30	25.50	7.05	27.66	30	15	60
6/4/2019	7	30	25.50	7.05	27.66	30	15	60
7/30/2019	8	30	25.50	7.05	27.66	30	15	60
8/27/2019	9	30	25.50	7.05	27.66	30	15	60
9/24/2019	10	15	25.50	7.05	27.66	30	15	60
10/1/2019	11	15	25.50	7.05	27.66	30	15	60
10/29/2019	12	15	25.50	7.05	27.66	30	15	60
12/3/2019	13	15	25.50	7.05	27.66	30	15	60
12/10/2019	14	15	25.50	7.05	27.66	30	15	60
1/21/2020	15	30	25.50	7.05	27.66	30	15	60
2/27/2020	16	30	25.50	7.05	27.66	30	15	60
3/17/2020	17	30	25.50	7.05	27.66	30	15	60
4/22/2020	18	30	25.50	7.05	27.66	30	15	60
5/27/2020	19	30	25.50	7.05	27.66	30	15	60
6/2/2020	20	30	25.50	7.05	27.66	30	15	60

Issued by:

Reviewed by:

Ayer Massachusetts WWTF Effluent Evaluation, June 2020.
Study Numbers 34144.

Data Appendix Page 8

STANDARD REFERENCE TOXICANT ANALYSIS

Exposure: 7 day Chronic

Species: Ceriodaphnia dubia

Toxicant: Copper - ug/L

Endpoint: Reproduction

DATE		C-NOEC	Mean	Std Dev	CV	CT	-1 Conc	+1 Conc
12/12/2018	1	30	20.25	8.46	41.80	30	15	60
1/15/2019	2	30	20.25	8.46	41.80	30	15	60
2/19/2019	3	30	20.25	8.46	41.80	30	15	60
3/19/2019	4	15	20.25	8.46	41.80	30	15	60
4/23/2019	5	7.5	20.25	8.46	41.80	30	15	60
4/30/2019	6	15	20.25	8.46	41.80	30	15	60
6/4/2019	7	30	20.25	8.46	41.80	30	15	60
7/30/2019	8	15	20.25	8.46	41.80	30	15	60
8/27/2019	9	30	20.25	8.46	41.80	30	15	60
9/24/2019	10	15	20.25	8.46	41.80	30	15	60
10/1/2019	11	15	20.25	8.46	41.80	30	15	60
10/29/2019	12	15	20.25	8.46	41.80	15	7.5	30
12/3/2019	13	15	20.25	8.46	41.80	15	7.5	30
12/10/2019	14	15	20.25	8.46	41.80	15	7.5	30
1/21/2020	15	7.5	20.25	8.46	41.80	15	7.5	30
2/27/2020	16	15	20.25	8.46	41.80	15	7.5	30
3/17/2020	17	30	20.25	8.46	41.80	15	7.5	30
4/22/2020	18	15	20.25	8.46	41.80	15	7.5	30
5/27/2020	19	30	20.25	8.46	41.80	15	7.5	30
6/2/2020	20	30	20.25	8.46	41.80	15	7.5	30

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Ayer Massachusetts WWTF Effluent Evaluation, June 2020.
Study Numbers 34144.

Data Appendix Page 9

STANDARD REFERENCE TOXICANT ANALYSIS

Exposure: 7 day Chronic

Species: *Ceriodaphnia dubia*

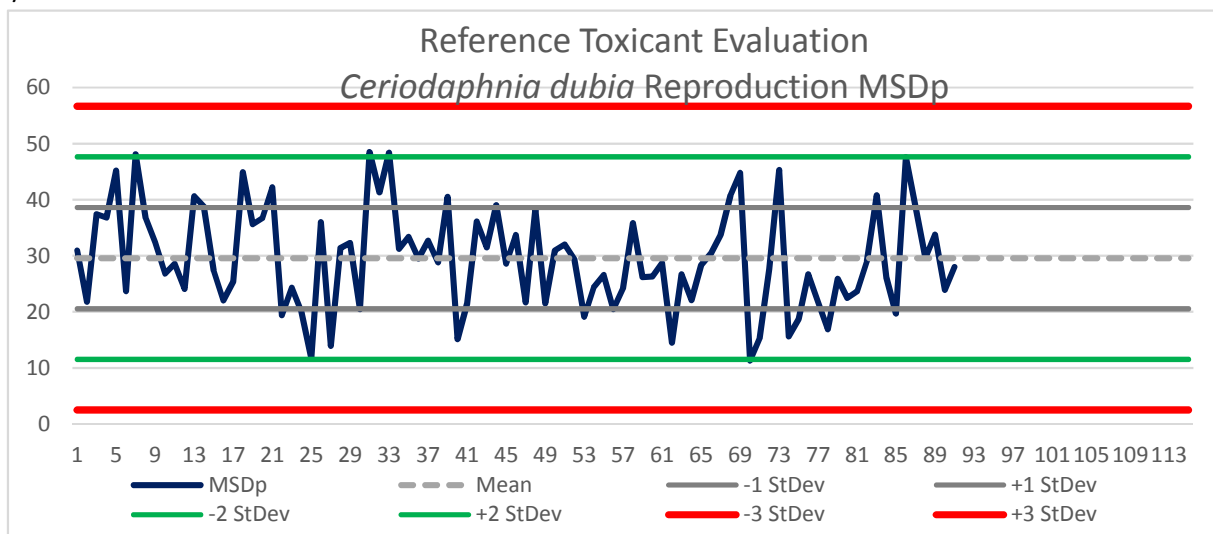
Toxicant: Copper - ug/L

Temperature: 25C

Long Term Mean: 29.56923

Long Term CV: 31%

Date	MSDp	Mean	Std Dev	2 Std Dev	CV	Mean -1 Std	Mean +1 Std	Mean -2 Std	Mean +2 Std	Mean -3 Std	Mean +3 Std
12/12/2018	27.6	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66
1/15/2019	45.3	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66
2/19/2019	15.6	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66
3/19/2019	75 18.7	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66
4/23/2019	26.7	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66
4/30/2019	21.7	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66
6/4/2019	16.9	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66
7/30/2019	25.9	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66
8/27/2019	80 22.5	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66
9/24/2019	23.7	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66
10/1/2019	29	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66
10/29/2019	40.8	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66
12/3/2019	26.1	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66
12/10/2019	85 19.7	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66
1/21/2020	47.6	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66
2/27/2020	38.8	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66
3/17/2020	29.6	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66
4/22/2020	33.8	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66
5/27/2020	90 23.9	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66
6/2/2020	28.0	29.57	9.03	18.06	30.54	20.54	38.60	11.51	47.63	2.48	56.66



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CETIS Test Data Worksheet

Report Date: 19 Jun-20 15:55 (p 1 of 3)
Test Code/ID: 34144Cd / 11-8425-1922

Ceriodaphnia 7-d Survival and Reproduction Test

Enthalpy Analytical, LLC

Start Date: 11 Jun-20 14:45 Species: Ceriodaphnia dubia Sample Code: 34144Cd
End Date: 18 Jun-20 14:40 Protocol: EPA/821/R-02-013 (2002) Sample Source: Ayer WWTF
Sample Date: 10 Jun-20 07:15 Material: WWTP, Municipal Treatment Plant Sample Station: MA0100013; Final Discharge

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male	Notes
0	MS	1	26	1							1	16	0	
0	MS	2	30	1							1	29	0	
0	MS	3	11	1							1	37	0	
0	MS	4	78	1							1	29	0	
0	MS	5	25	1							1	30	0	
0	MS	6	70	1							1	32	0	
0	MS	7	38	1							1	33	0	
0	MS	8	44	1							1	40	0	
0	MS	9	18	1							1	28	0	
0	MS	10	14	1							1	25	0	
0	RW	1	49	1							1	42	0	
0	RW	2	12	1							1	39	0	
0	RW	3	15	1							1	38	0	
0	RW	4	36	1							1	29	0	
0	RW	5	1	1							1	35	0	
0	RW	6	4	1							1	38	0	
0	RW	7	61	1							1	26	0	
0	RW	8	9	1							1	33	0	
0	RW	9	67	1							1	36	0	
0	RW	10	2	1							1	47	0	
6.25		1	64	1							1	27	0	
6.25		2	17	1							1	23	0	
6.25		3	34	1							1	38	0	
6.25		4	52	1							1	34	0	
6.25		5	66	1							1	17	0	
6.25		6	20	1							1	46	0	
6.25		7	60	1							1	35	0	
6.25		8	29	1							1	19	0	
6.25		9	31	1							1	27	0	
6.25		10	22	1							1	45	0	
7.7		1	27	1							1	24	0	
7.7		2	47	1							1	32	0	
7.7		3	75	1							1	31	0	
7.7		4	3	1							1	30	0	

CETIS Test Data Worksheet

Report Date: 19 Jun-20 15:55 (p 2 of 3)
Test Code/ID: 34144Cd / 11-8425-1922

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male	Notes
7.7		5	35	1							1	36	0	
7.7		6	71	1							1	35	0	
7.7		7	42	1							1	36	0	
7.7		8	6	1							1	29	0	
7.7		9	53	1							1	26	0	
7.7		10	16	1							1	10	0	
12.5		1	56	1							1	24	0	
12.5		2	10	1							1	37	0	
12.5		3	21	1							1	21	0	
12.5		4	43	1							1	24	0	
12.5		5	69	1							1	31	0	
12.5		6	54	1							1	32	0	
12.5		7	7	1							1	17	0	
12.5		8	40	1							1	31	0	
12.5		9	77	1							1	26	0	
12.5		10	73	1							1	30	0	
25		1	24	1							1	7	0	
25		2	8	1							1	35	0	
25		3	28	1							1	32	0	
25		4	19	1							1	27	0	
25		5	72	1							1	34	0	
25		6	59	1							1	11	0	
25		7	76	1							1	37	0	
25		8	63	1							1	33	0	
25		9	74	1							1	40	0	
25		10	80	1							1	37	0	
50		1	46	1							1	24	0	
50		2	48	1							1	32	0	
50		3	58	1							1	34	0	
50		4	13	1							1	29	0	
50		5	33	1							1	33	0	
50		6	37	1							1	18	0	
50		7	65	1							1	44	0	
50		8	39	1							1	31	0	
50		9	50	1							1	40	0	
50		10	62	1							1	7	0	
100		1	55	1							1	2	0	
100		2	57	1							1	21	0	

CETIS Test Data Worksheet

Report Date: 19 Jun-20 15:55 (p 3 of 3)
 Test Code/ID: 34144Cd / 11-8425-1922

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male	Notes
100		3	68	1							1	13	0	
100		4	23	1							1	0	0	
100		5	79	1							1	0	0	
100		6	41	1							1	13	0	
100		7	32	1							1	22	0	
100		8	51	1							1	19	0	
100		9	45	1							1	37	0	
100		10	5	1							1	18	0	

CETIS Summary Report

Report Date: 19 Jun-20 15:55 (p 1 of 2)

Test Code/ID: 34144Cd / 11-8425-1922

Ceriodaphnia 7-d Survival and Reproduction Test							Enthalpy Analytical, LLC				
Batch ID:	14-0151-1258		Test Type:	Reproduction-Survival (7d)			Analyst:	Meredith Wheeler			
Start Date:	11 Jun-20 14:45		Protocol:	EPA/821/R-02-013 (2002)			Diluent:	Receiving Water			
Ending Date:	18 Jun-20 14:40		Species:	Ceriodaphnia dubia			Brine:	Not Applicable			
Test Length:	7d		Taxon:	Branchiopoda			Source:	In-House Culture		Age: <24	
Sample ID:	16-2904-6032		Code:	34144Cd			Project:	Second Quarter WET Compliance Tes			
Sample Date:	10 Jun-20 07:15		Material:	WWTP, Municipal Treatment Plant			Source:	Ayer WWTF			
Receipt Date:	10 Jun-20 08:55		CAS (PC):				Station:	MA0100013; Final Discharge			
Sample Age:	32h (4 °C)		Client:	Town of Ayer, DPW							
Multiple Comparison Summary											
Analysis ID	Endpoint	Comparison Method			✓	NOEL	LOEL	TOEL	TU	PMSD	S
10-6603-1865	7d Proportion Survived	Fisher Exact/Bonferroni-Holm Test				100	>100	n/a	1	n/a	1
13-7175-9649	Reproduction	Dunnett Multiple Comparison Test				50	100	70.71	2	27.0%	1
Point Estimate Summary											
Analysis ID	Endpoint	Point Estimate Method			✓	Level	%	95% LCL	95% UCL	TU	S
09-6692-7174	Reproduction	Linear Interpolation (ICPIN)				IC25	53.5	5.5	65	1.869	1
7d Proportion Survived Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	MS	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
0	RW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
7.7		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	MS	10	29.9	25.2	34.6	16	40	2.08	6.57	21.99%	0.00%
0	RW	10	36.3	32	40.6	26	47	1.92	6.07	16.73%	-21.40%
6.25		10	31.1	23.8	38.4	17	46	3.22	10.2	32.70%	-4.01%
7.7		10	28.9	23.3	34.5	10	36	2.46	7.77	26.87%	3.34%
12.5		10	27.3	23	31.6	17	37	1.89	5.96	21.85%	8.70%
25		10	29.3	21.2	37.4	7	40	3.57	11.3	38.51%	2.01%
50		10	29.2	21.5	36.9	7	44	3.38	10.7	36.63%	2.34%
100		10	14.5	6.18	22.8	0	37	3.68	11.6	80.25%	51.51%

CETIS Summary Report

Report Date: 19 Jun-20 15:55 (p 2 of 2)
Test Code/ID: 34144Cd / 11-8425-1922

Ceriodaphnia 7-d Survival and Reproduction Test											Enthalpy Analytical, LLC
7d Proportion Survived Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	MS	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
0	RW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
7.7		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Reproduction Detail											
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	MS	16	29	37	29	30	32	33	40	28	25
0	RW	42	39	38	29	35	38	26	33	36	47
6.25		27	23	38	34	17	46	35	19	27	45
7.7		24	32	31	30	36	35	36	29	26	10
12.5		24	37	21	24	31	32	17	31	26	30
25		7	35	32	27	34	11	37	33	40	37
50		24	32	34	29	33	18	44	31	40	7
100		2	21	13	0	0	13	22	19	37	18

CETIS Analytical Report

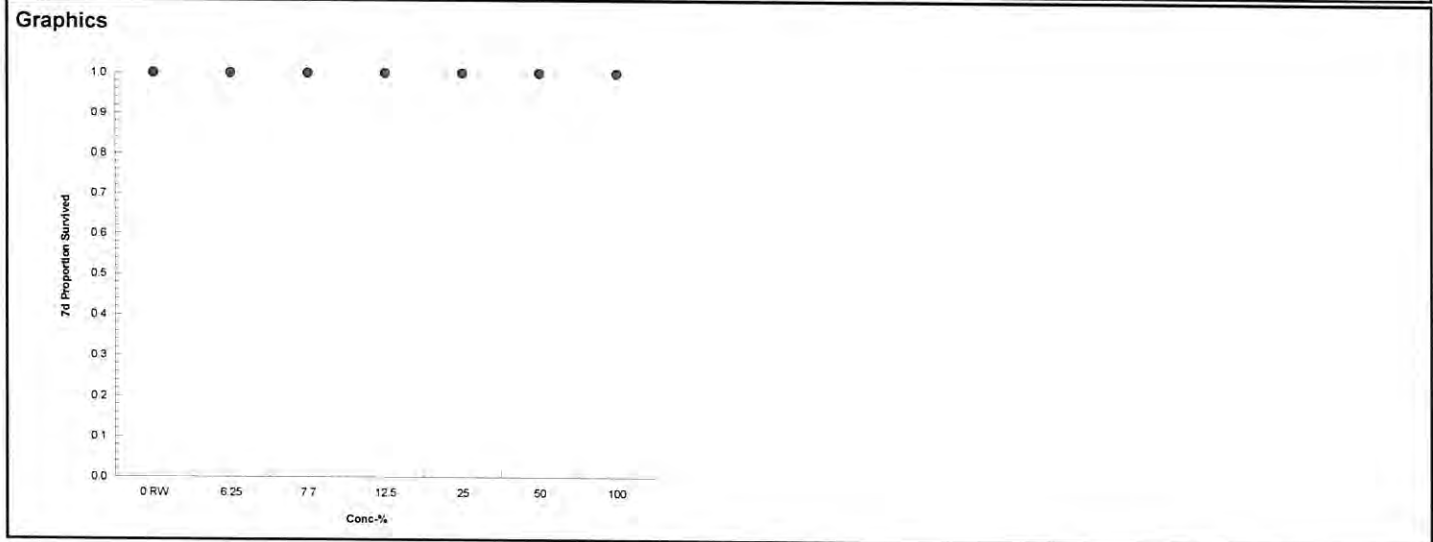
Report Date: 19 Jun-20 15:55 (p 1 of 1)
Test Code/ID: 34144Cd / 11-8425-1922

Ceriodaphnia 7-d Survival and Reproduction Test				Enthalpy Analytical, LLC	
Analysis ID: 10-6603-1865		Endpoint: 7d Proportion Survived		CETIS Version: CETISv1.9.6	
Analyzed: 19 Jun-20 15:55		Analysis: STP 2xK Contingency Tables		Status Level: 1	
Sample ID: 16-2904-6032		Code: 34144Cd		Project: Second Quarter WET Compliance Tes	
Sample Date: 10 Jun-20 07:15		Material: WWTP, Municipal Treatment Plant		Source: Ayer WWTF	
Receipt Date: 10 Jun-20 08:55		CAS (PC):		Station: MA0100013; Final Discharge	
Sample Age: 32h (4 °C)		Client: Town of Ayer, DPW			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	>100	n/a	1

Fisher Exact/Bonferroni-Holm Test						
Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Receiving Water		6.25	1.000	Exact	1.0000	Non-Significant Effect
		7.7	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary							
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	RW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
7.7		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%



CETIS Analytical Report

Report Date: 19 Jun-20 15:55 (p 1 of 1)
Test Code/ID: 34144Cd / 11-8425-1922

Ceriodaphnia 7-d Survival and Reproduction Test				Enthalpy Analytical, LLC	
Analysis ID:	13-7175-9649	Endpoint:	Reproduction	CETIS Version:	CETISv1.9.6
Analyzed:	19 Jun-20 15:55	Analysis:	Parametric-Control vs Treatments	Status Level:	1
Sample ID:	16-2904-6032	Code:	34144Cd	Project:	Second Quarter WET Compliance Tes
Sample Date:	10 Jun-20 07:15	Material:	WWTP, Municipal Treatment Plant	Source:	Ayer WWTF
Receipt Date:	10 Jun-20 08:55	CAS (PC):		Station:	MA0100013; Final Discharge
Sample Age:	32h (4 °C)	Client:	Town of Ayer, DPW		

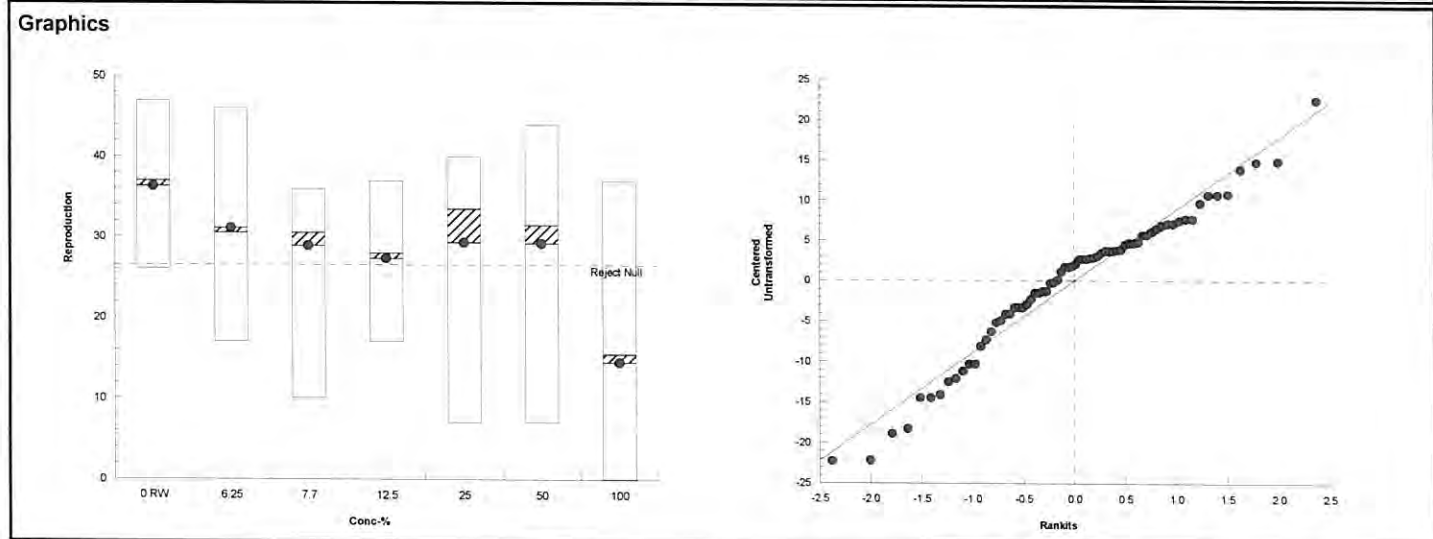
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	50	100	70.71	2	27.01%

Dunnett Multiple Comparison Test									
Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Receiving Water		6.25	1.24	2.34	9.81	18	CDF	0.3409	Non-Significant Effect
		7.7	1.77	2.34	9.81	18	CDF	0.1559	Non-Significant Effect
		12.5	2.15	2.34	9.81	18	CDF	0.0755	Non-Significant Effect
		25	1.67	2.34	9.81	18	CDF	0.1831	Non-Significant Effect
		50	1.7	2.34	9.81	18	CDF	0.1760	Non-Significant Effect
		100*	5.21	2.34	9.81	18	CDF	6.9E-06	Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2651.29	441.881	6	5.04	2.8E-04	Significant Effect
Error	5520.2	87.6222	63			
Total	8171.49		69			

ANOVA Assumptions Tests					
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	7.76	16.8	0.2565	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.966	0.953	0.0525	Normal Distribution

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	RW	10	36.3	32	40.6	37	26	47	1.92	16.73%	0.00%
6.25		10	31.1	23.8	38.4	30.5	17	46	3.22	32.70%	14.33%
7.7		10	28.9	23.3	34.5	30.5	10	36	2.46	26.87%	20.39%
12.5		10	27.3	23	31.6	28	17	37	1.89	21.85%	24.79%
25		10	29.3	21.2	37.4	33.5	7	40	3.57	38.51%	19.28%
50		10	29.2	21.5	36.9	31.5	7	44	3.38	36.63%	19.56%
100		10	14.5	6.18	22.8	15.5	0	37	3.68	80.25%	60.06%



CETIS Analytical Report

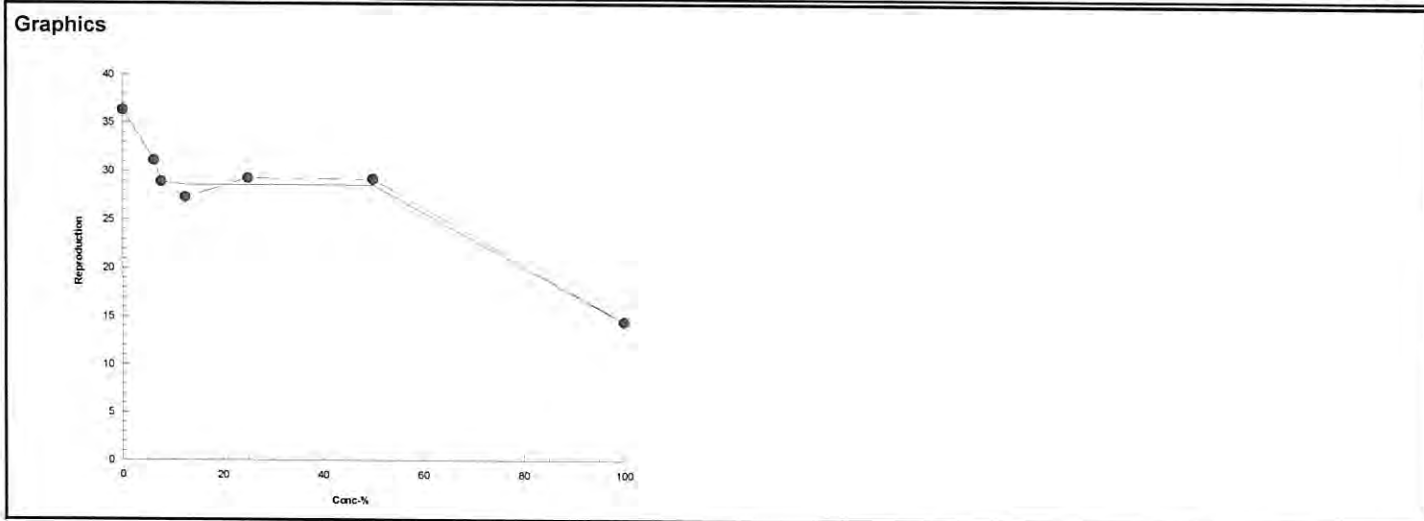
Report Date: 19 Jun-20 15:55 (p 1 of 1)
Test Code/ID: 34144Cd / 11-8425-1922

Ceriodaphnia 7-d Survival and Reproduction Test				Enthalpy Analytical, LLC	
Analysis ID: 09-6692-7174		Endpoint: Reproduction		CETIS Version: CETISv1.9.6	
Analyzed: 19 Jun-20 15:55		Analysis: Linear Interpolation (ICPIN)		Status Level: 1	
Sample ID: 16-2904-6032		Code: 34144Cd		Project: Second Quarter WET Compliance Tes	
Sample Date: 10 Jun-20 07:15		Material: WWTP, Municipal Treatment Plant		Source: Ayer WWTF	
Receipt Date: 10 Jun-20 08:55		CAS (PC):		Station: MA0100013; Final Discharge	
Sample Age: 32h (4 °C)		Client: Town of Ayer, DPW			

Linear Interpolation Options					
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	844827	200	Yes	Two-Point Interpolation

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	53.5	5.5	65	1.869	1.54	18.2

Reproduction Summary			Calculated Variate						Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	Mean	%Effect
0	RW	10	36.3	26	47	6.07	16.70%	0.0%	36.3	0.0%
6.25		10	31.1	17	46	10.2	32.70%	14.3%	31.1	14.3%
7.7		10	28.9	10	36	7.77	26.90%	20.4%	28.9	20.4%
12.5		10	27.3	17	37	5.96	21.80%	24.8%	28.6	21.2%
25		10	29.3	7	40	11.3	38.50%	19.3%	28.6	21.2%
50		10	29.2	7	44	10.7	36.60%	19.6%	28.6	21.2%
100		10	14.5	0	37	11.6	80.20%	60.1%	14.5	60.1%



Ceriodaphnia dubia - Blocking By Parentage Tracking Sheet

ESI #: 34144

CLIENT: Ayer

START DATE: 06/11/20

START TIME: 1440

INITIAL: CMC

COLUMN added to	<u>C. dubia ADULT USED</u>	
	board #	cup #
A	MHR 975	5C
B		5F
C		5G
D		5J
E		1B
F		2E
G		1F
H		1H
I	MSR 1144	3E
J		3C

FRESHWATER CHRONIC ASSAY - NEW WATER QUALITIES
C. dubia

STUDY: 34144		CLIENT: Ayer, MA WWTF								SAMPLE: EFFLUENT		DILUENT: Receiving Water (RW)							
NEW DISSOLVED OXYGEN (mg/L)										pH (SU)									
CONC	REP	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7		
MSR	A	8.6	8.7	8.7	8.8	8.8	8.8	8.7		8.10	7.93	7.79	7.87	7.83	8.20	7.87			
RW	A	9.9	9.1	8.7	8.7	9.0	8.8	8.7		6.99	7.16	6.96	6.95	7.03	7.08	7.14			
6.25%	A	9.9	9.1	8.7	8.8	9.1	8.8	8.7		7.13	7.23	7.12	7.12	7.06	7.30	7.12			
7.7%	A	9.8	9.0	8.7	8.8	9.1	8.8	8.7		7.18	7.32	7.17	7.14	7.11	7.34	7.20			
12.5%	A	9.8	9.0	8.7	8.7	9.1	8.8	8.8		7.27	7.48	7.29	7.23	7.23	7.44	7.31			
25%	A	9.7	9.0	8.7	8.8	9.1	8.8	8.8		7.47	7.60	7.49	7.44	7.41	7.63	7.47			
50%	A	9.7	9.0	8.8	8.8	9.1	8.9	8.8		7.68	7.80	7.74	7.68	7.65	7.82	7.68			
100%	A	9.6	9.0	9.1	9.1	9.3	9.0	9.4		7.83	7.93	7.96	7.89	7.81	7.98	7.84			
NEW SPECIFIC CONDUCTIVITY (µmhos/cm)										NEW TEMPERATURE (°C)									
CONC	REP	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7		
MSR	A	204	199	200	201	200	203	203		24	23	22	22	22	23	23			
RW	A	334	327	326	333	324	321	322		24	23	23	23	23	23	23			
6.25%	A	397	394	393	401	397	390	390		24	23	23	23	23	23	23			
7.7%	A	416	409	407	418	404	408	411		24	23	23	23	23	23	23			
12.5%	A	469	461	456	463	457	453	457		24	23	23	23	23	23	23			
25%	A	606	596	577	595	578	586	581		24	23	23	24	23	23	23			
50%	A	856	845	823	847	837	839	849		24	23	23	23	23	23	23			
100%	A	1372	1355	1320	1333	1319	1344	1343		24	23	23	23	23	23	23			
Inc. Temp. °C		25	25	25	25	25	25	25											
DATE:		06/11/20	06/12	06/13	06/14/20	06/15	06/16/20	6/17											
TIME:		0845	1055	1035	1030	1035	1505	1245											
INITIALS:		GRS	CFS	CFS	GRS	PLES	GRS	MW											

RW = Receiving Water

DAY 0 (START)								DAY 2 (1 ST RENEWAL)				DAY 5 (2 ND RENEWAL)			
	METALS	TOC	ALK	HARD	AMM	TS/TDS	TRC	ALK	HARD	AMM	TRC	ALK	HARD	AMM	TRC
EFF	-002	-003	-004	-005	-006	-007	<0.02	-017	-018	-019	<0.02	-027	-028	-029	<0.02
RW	-009	-010	-011	-012	-013			-021	-022	-023		-031	-032	-033	

Did 1st Renewal sample cause ≥50% mortality? Yes _____ No X
If "YES" put into circulation TOC and METALS bottles. _____

Did 2nd Renewal sample cause ≥50% mortality? Yes _____ No X
If "YES" put into circulation TOC and METALS bottles. _____

***Ceriodaphnia dubia* CHRONIC REPRODUCTION ASSAY**
OLD WATER QUALITIES

STUDY: 34144		CLIENT: Ayer, MA WWTF				SAMPLE: Effluent						
CONC	DAY	pH (SU)	Temp (°C)	DO (mg/L)	S/C (µMHOS/CM)	CONC	DAY	pH (SU)	Temp (°C)	DO (mg/L)	S/C (µMHOS/CM)	INIT
MSR	1	8.14	21	9.0	212	12.5%	1	8.05	21	8.7	458	CFS
	2	8.05	19	9.1	201		2	8.14	19	8.9	449	BG
	3	8.15	19	9.2	211		3	8.07	19	9.0	462	CMC
	4	8.10	19	9.1	209		4	8.07	19	9.0	455	GRS
	5	8.06	22	8.9	220		5	8.00	22	8.6	480	CFS
	6	7.99	21	9.0	217		6	8.00	21	8.8	467	GRS
	7	8.09	21	8.9	225		7	8.12	21	8.6	481	JTP
	8						8					
RW	1	8.00	21	8.9	333	25%	1	8.26	21	8.7	587	
	2	7.93	19	9.0	324		2	8.34	19	8.9	579	
	3	7.93	20	9.1	341		3	8.24	19	9.0	582	
	4	7.94	20	9.0	334		4	8.25	19	9.0	583	
	5	7.82	22	8.7	349		5	8.19	22	8.6	618	
	6	7.89	21	8.8	341		6	8.15	21	8.8	603	
	7	7.91	21	8.7	350		7	8.29	21	8.6	615	
	8						8					
6.25%	1	7.99	21	8.9	392	50%	1	8.48	21	8.7	830	
	2	8.01	20	8.9	389		2	8.56	19	8.9	811	
	3	7.99	20	9.1	407		3	8.49	19	9.2	829	
	4	7.96	19	9.0	395		4	8.50	19	9.1	825	
	5	7.90	22	8.7	419		5	8.40	22	8.6	871	
	6	7.89	21	8.8	406		6	8.40	21	8.9	849	
	7	7.99	22	8.6	423		7	8.52	21	8.6	886	
	8						8					
7.7%	1	7.98	21	8.7	410	100%	1	8.70	21	8.8	1322	
	2	8.05	20	8.9	400		2	8.80	19	9.0	1281	
	3	8.00	19	9.0	415		3	8.71	19	9.3	1285	
	4	7.98	19	9.0	412		4	8.74	19	9.3	1284	
	5	7.92	22	8.6	431		5	8.65	22	8.6	1359	
	6	7.91	21	8.8	418		6	8.69	21	9.2	1338	
	7	8.01	22	8.6	441		7	8.76	21	8.7	1395	
	8						8					

RW = RECEIVING WATER

PREPARATION OF DILUTIONS

STUDY: 34144		CLIENT: Ayer	
SPECIES: <i>C. dubia</i>			
Diluent: Receiving Water	$E_0 = 24.5^\circ\text{C}$ $D_0 = 24.1^\circ\text{C}$ Sample: E_0, D_0		
Concentration %	Vol. Eff. (mL)	Final Vol. (mL)	
Lab Control	0	100	
Receiving Water	0	100	
6.25%	6.25	100	
12.5%	12.5	100	
25%	25	100	
50%	50	100	
100%	100	100	
INITIALS:	CFS		
TIME:	0840		
DATE:	06/11/20		

PREPARATION of DILUTIONS

STUDY: 34144			CLIENT: Ayer, MA WWTF		
SPECIES: <i>C. dubia</i>			TEST: chronic renewal		
START	Day: 0 $E_0 = 24.8^\circ\text{C}$ $D_0 = 24.4^\circ\text{C}$		Day: 1 $E_0 = 24.1^\circ\text{C}$ $D_0 = 23.7^\circ\text{C}$		Day:
Diluent: RW	Sample: E_0, D_0		Sample: E_0, D_0		Sample:
Concentration	Vol. Eff.	Final Vol.	Vol. Eff.	Final Vol.	Vol. Eff.
MSR	0	200	0	200	
RW	0		0		
6.25%	12.5		12.5		
7.7%	15.4		15.4		
12.5%	25		25		
25%	50		50		
50%	100		100		
100%	200	↓	200	↓	
1st Renewal	Day: 2 $E_1 = 24.4^\circ\text{C}$ $D_1 = 24.2^\circ\text{C}$		Day: 3 $E_1 = 25.0^\circ\text{C}$ $D_1 = 25.5^\circ\text{C}$		Day: 4 $E_1 = 24.2^\circ\text{C}$ $D_1 = 24.1^\circ\text{C}$
Diluent: RW	Sample: E_1, D_1		Sample: E_1, D_1		Sample:
Concentration	Vol. Eff.	Final Vol.	Vol. Eff.	Final Vol.	Vol. Eff.
MSR	0	200	0	200	0
RW	0		0		0
6.25%	12.5		12.5		12.5
7.7%	15.4		15.4		15.4
12.5%	25		25		25
25%	50		50		50
50%	100		100		100
100%	200	↓	200	↓	200
2nd Renewal	Day: 5 $E_2 = 24.8^\circ\text{C}$ $D_2 = 25.1^\circ\text{C}$		Day: 6 $E_2 = 24.8^\circ\text{C}$ $D_2 = 25.1^\circ\text{C}$		Day:
Diluent: RW	Sample: E_2, D_2		Sample: E_2, D_2		Sample:
Concentration	Vol. Eff.	Final Vol.	Vol. Eff.	Final Vol.	Vol. Eff.
MSR	0	200	0	200	
RW	0		0		
6.25%	12.5		12.5		
7.7%	15.4		15.4		
12.5%	25		25		
25%	50		50		
50%	100		100		
100%	200	↓	200	↓	

RW = Receiving Water

MSR ID:

Day 0: 34128, W-1294
Day 1: 34128, W-1294
Day 2: 34128, W-1294
Day 3: 34128, W-1294
Day 4: 34128, W-1294
Day 5: 34128, W-1294
Day 6: 34128, W-1294
Day 7: _____

On day 5 effluent was warmed to 25.1°C and not 25.1°C.

RECORD OF METERS USED

STUDY: 34144		CLIENT: Ayer, MA	
C. dubia			
Exposure (Hours)			
	0	24	48
Water Quality Station #	2	2	2
Initials / Date	GRS 06/11/20	CFS 06/12	CFS 06/13

Water Quality Station #1		Water Quality Station #2		COMMENTS
DO meter #	ML01	DO meter #	ML02	
DO probe #	96	DO probe #	160	
pH meter #	ML01	pH meter #	ML02	
pH probe #	168	pH probe #	169	
S/C meter #	ML01	S/C meter #	ML02	
S/C probe #	159	S/C probe #	1	

RECORD OF METERS USED FOR WATER QUALITY MEASUREMENT

C. dubia

STUDY: 34144				CLIENT: Ayer, MA WWTF						
OLD WATER QUALITIES										
	0	1	2	3	4	5	6	7	8	
Water Quality Station #	/	2	21 <small>(20-06/13)</small>	2	2	2	1	2		
Temperature: Thermometer or Probe #	/	1	159	1	1	1	159	1		
Initials	/	CFS	BG	CMC	GRS	CFS	GRS	JTP		
NEW WATER QUALITIES										
	0	1	2	3	4	5	6	7	8	
Water Quality Station #	2	1	1	2	2	1	2	/	/	
Temperature: Thermometer or Probe #	1	159	159	1	1	159	1	/	/	
Initials	GRS	CFS	CFS	GRS	DES	GRS	MW	/	/	
Date	06/11/20	06/12	06/13	06/14/20	06/15/20	06/16/20	06/17/20	06/18/20		

Water Quality Station #1		Water Quality Station #2		COMMENTS
DO meter #		DO meter #		
DO probe #	ML01	DO probe #	ML02	
pH meter #	96	pH meter #	160	
pH probe #	ML01	pH probe #	ML02	
S/C meter #	168	pH probe #	169	
S/C probe #	ML01	S/C meter #	ML02	
	159	S/C probe #	1	

Report No: 34144 SDG:
Project: Ayer

Sample ID: Effluent Start
Matrix: Water
Sampled: 06/10/20 0745

Parameter		Result		Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Total solids	34144-007	790		20	mg/L	06/11/20 1210	06/16/20 1040	BG /SM 2540B
Total dissolved solids	34144-007	880		20	mg/L	06/15/20 1550	06/15/20 1550	JTP/Probe
Alkalinity as CaCO3	34144-004	260		10	mg/L	06/11/20 1330	06/11/20 1330	AS /EPA 310.2
Total organic carbon	34144-003	6.8	B 1.5	1.2	mg/L	06/11/20 1620	06/11/20 1630	AS /SM 5310 B
Ammonia-N	34144-006	0.34		0.1	mg/L as N	06/16/20 1131	06/16/20 1131	AS /SM 4500-NH3 G
Hardness as CaCO3	34144-005	210		0.7	mg/L	06/15/20 1030	06/15/20 1423	AS /ess/SW 846 3rd Ed. 6020
Aluminum, total	34144-002	0.037		0.02	mg/L	06/15/20 0845	06/16/20 1831	AS /EPA 200.8
Cadmium, total	34144-002	ND		0.0003	mg/L	06/15/20 0845	06/16/20 1831	AS /EPA 200.8
Calcium, total	34144-002	68.7		0.1	mg/L	06/15/20 0845	06/16/20 1831	AS /EPA 200.8
Copper, total	34144-002	0.0031		0.0005	mg/L	06/15/20 0845	06/16/20 1831	AS /EPA 200.8
Lead, total	34144-002	ND		0.0003	mg/L	06/15/20 0845	06/16/20 1831	AS /EPA 200.8
Magnesium, total	34144-002	11.5		0.1	mg/L	06/15/20 0845	06/16/20 1831	AS /EPA 200.8
Nickel, total	34144-002	0.0035		0.001	mg/L	06/15/20 0845	06/16/20 1831	AS /EPA 200.8
Zinc, total	34144-002	0.034		0.002	mg/L	06/15/20 0845	06/16/20 1831	AS /EPA 200.8

Sample ID: Effluent First Renewal
Matrix: Water
Sampled: 06/12/20 0630

Parameter		Result		Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO3	34144-017	240		10	mg/L	06/17/20 1237	06/17/20 1237	AS /EPA 310.2
Ammonia-N	34144-019	ND		0.1	mg/L as N	06/16/20 1134	06/16/20 1134	AS /SM 4500-NH3 G
Hardness as CaCO3	34144-018	200		0.7	mg/L	06/15/20 1030	06/15/20 1428	AS /ess/SW 846 3rd Ed. 6020

Sample ID: Effluent Second Renewal
Matrix: Water
Sampled: 06/15/20 0630

Parameter		Result		Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO3	34144-027	250		10	mg/L	06/17/20 1238	06/17/20 1238	AS /EPA 310.2
Ammonia-N	34144-029	ND		0.1	mg/L as N	06/16/20 1136	06/16/20 1136	AS /SM 4500-NH3 G
Hardness as CaCO3	34144-028	210		1	mg/L	06/22/20 1200	06/22/20 1346	AS /ess/SW 846 3rd Ed. 6020

Notes:

ND = Not Detected

B = Analyte found in laboratory at level indicated. Results may be used with due consideration.

Report No: 34144 SDG:
Project: Ayer

Sample ID: Receiving Water Start
Matrix: Water
Sampled: 06/10/20 0745

Parameter		Result		Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO ₃	34144-011	23		2	mg/L	06/11/20 1327	06/11/20 1327	AS /EPA 310.2
Total organic carbon	34144-010	4.1	B 0.5	0.4	mg/L	06/11/20 1620	06/11/20 1630	AS /SM 5310 B
Ammonia-N	34144-013	ND		0.1	mg/L as N	06/16/20 1133	06/16/20 1133	AS /SM 4500-NH ₃ G
Hardness as CaCO ₃	34144-012	43		0.7	mg/L	06/15/20 1030	06/15/20 1426	AS /ess/SW846 3rd Ed. 6020
Aluminum, total	34144-009	0.079		0.02	mg/L	06/15/20 0845	06/16/20 1837	AS /EPA 200.8
Cadmium, total	34144-009	ND		0.0003	mg/L	06/15/20 0845	06/16/20 1837	AS /EPA 200.8
Calcium, total	34144-009	13.3		0.1	mg/L	06/15/20 0845	06/16/20 1837	AS /EPA 200.8
Copper, total	34144-009	0.0027		0.0005	mg/L	06/15/20 0845	06/16/20 1837	AS /EPA 200.8
Lead, total	34144-009	0.0017		0.0003	mg/L	06/15/20 0845	06/16/20 1837	AS /EPA 200.8
Magnesium, total	34144-009	2.47		0.1	mg/L	06/15/20 0845	06/16/20 1837	AS /EPA 200.8
Nickel, total	34144-009	0.0012		0.001	mg/L	06/15/20 0845	06/16/20 1837	AS /EPA 200.8
Zinc, total	34144-009	0.0055		0.002	mg/L	06/15/20 0845	06/16/20 1837	AS /EPA 200.8

Sample ID: Receiving Water First Renewal
Matrix: Water
Sampled: 06/12/20 0710

Parameter		Result		Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO ₃	34144-021	22		2	mg/L	06/17/20 1233	06/17/20 1233	AS /EPA 310.2
Ammonia-N	34144-023	ND		0.1	mg/L as N	06/16/20 1135	06/16/20 1135	AS /SM 4500-NH ₃ G
Hardness as CaCO ₃	34144-022	45		0.7	mg/L	06/15/20 1030	06/15/20 1430	AS /ess/SW846 3rd Ed. 6020

Sample ID: Receiving Water Second Renewal
Matrix: Water
Sampled: 06/15/20 0805

Parameter		Result		Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO ₃	34144-031	21		2	mg/L	06/17/20 1234	06/17/20 1234	AS /EPA 310.2
Ammonia-N	34144-033	ND		0.1	mg/L as N	06/16/20 1137	06/16/20 1137	AS /SM 4500-NH ₃ G
Hardness as CaCO ₃	34144-032	41		1	mg/L	06/22/20 1200	06/22/20 1349	AS /ess/SW846 3rd Ed. 6020

Notes:

ND = Not Detected

B = Analyte found in laboratory at level indicated. Results may be used with due consideration.

SAMPLE RECEIPT RECORD FOR CHRONIC TOXICITY EVALUATIONS

STUDY #: 34144		CLIENT: AYER	
SAMPLE RECEIPT INFORMATION			
Receipt Date & Time:	06/10/20 0855	6/12/20 0940	6/15/20 0815
Received By:	DW	DW	DW
Temperature at Receipt:	—	—	—
Delivered Via:	<input checked="" type="checkbox"/> Enthalpy <input type="checkbox"/> Client <input type="checkbox"/> Courier <input type="checkbox"/> FedEx <input type="checkbox"/> UPS	<input checked="" type="checkbox"/> Enthalpy <input type="checkbox"/> Client <input type="checkbox"/> Courier <input type="checkbox"/> FedEx <input type="checkbox"/> UPS	<input checked="" type="checkbox"/> Enthalpy <input type="checkbox"/> Client <input type="checkbox"/> Courier <input type="checkbox"/> FedEx <input type="checkbox"/> UPS
Logged In Date & Time:	06/10/20 1545	6/12/20 1345	6/15/20 1445
Logged at Lab By:	PBS	MW	MW
Temperature at Log In:	3.9°C	3°C	1.7°C
SAMPLE CONDITION INFORMATION			
Chain of Custody?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Chain of Custody Signed?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Chain of Custody Complete?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Sample Date?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Sample Time?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Sample Type?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Custody Seal in Place?	Yes <input checked="" type="radio"/> NA No	Yes <input checked="" type="radio"/> NA No	Yes <input checked="" type="radio"/> NA No
Shipping Container Intact?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Client notified of temp?	Yes or <input checked="" type="radio"/> No	Yes or <input checked="" type="radio"/> No	Yes or <input checked="" type="radio"/> No
Sample Arrived on Ice?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
COMMENTS:	DW needs to sign RW effluent is signed. No temp taken at time of receipt See LOC	DW sign 1st Ren See COC	See TOC Tmet not preserved; preserved at lab.

CHAIN OF CUSTODY DOCUMENTATION

Client: Ayer, Ma WWTF	Contact: Paula Boyle	Project Name: Ayer, MA	Q2 2020
Report to: Paula Boyle	Address: Hoyle Tanner & Assoc Inc	Project Number: P0064	Task: 0001
Invoice to: Paula Boyle	Address: Manchester, NH 03101	Project Manager: Paula Boyle	
Voice: 603-669-5555	Fax: 603-669-4168	email: sewer@ayer.ma.us	P.O: '

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
001	Effluent Start	6-9 6-10	0745 0715	TW	C	1	3750	P	4 C	Water	N	CD7DCR, CD48AD StartSample
002	Effluent Start	6-9 6-10	0745 0715	TW	C	1	250	P	HNO3	Water	N	Total Metals Cd,Ni,Pb,Cu,Zn,Al,Ca,Mg;
003	Effluent Start	6-9 6-10	0745 0715	TW	C	1	40	G	4 C	Water	N	TOC
004	Effluent Start	6-9 6-10	0745 0715	TW	C	1	125	P	4 C	Water	N	ALK
005	Effluent Start	6-9 6-10	0745 0715	TW	C	1	125	P	HNO3	Water	N	Metals Hard;
006	Effluent Start	6-9 6-10	0745 0715	TW	C	1	125	P	H2SO4	Water	N	NH3;
007	Effluent Start	6-9 6-10	0745 0715	TW	C	1	500	P	4 C	Water	N	TS,TDS

Relinquished By: <i>[Signature]</i>	Date: 6-10-20	Time: 0855	Received By: <i>[Signature]</i>	Date: 6-10-20	Time: 0855	Temp (C):	Meter ID:
Relinquished By: <i>[Signature]</i>	Date: 6-10-20	Time: 13:00	Received at Lab By: <i>[Signature]</i>	Date: 06/10/20	Time: 13:00	Temp (C): 3.9	Meter ID: T-295
Comments: Effluent composite sample collected in 30 minute intervals from 0745 6-9-20 through 0715 6-10-20. 48 Total Effluent grab samples collected over 24 Hr Effluent composite collection period.							



Enthalpy Analytical
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345

Enthalpy Job No:

CHAIN OF CUSTODY DOCUMENTATION

Client: Ayer, Ma WWTF	Contact: Paula Boyle	Project Name: Ayer, MA <i>Q2 2020</i>
Report to: Paula Boyle	Address: Hoyle Tanner & Assoc Inc	Project Number: P0064 Task: 0001
Invoice to: Paula Boyle	Address: Manchester, NH 03101	Project Manager: Paula Boyle
Voice: 603-669-5555	Fax: 603-669-4168	email: sewer@ayer.ma.us P.O: '

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
008	Receiving Water Start	<i>6-10-20</i>	<i>0745</i>	<i>TW</i>	<i>G</i>	1	3750	P	4 C	Water	N	CD7DCR StartDiluent
009	Receiving Water Start	<i>6-10-20</i>	<i>0745</i>	<i>TW</i>	<i>G</i>	1	250	P	HNO3	Water	N	Total Metals Cd,Ni,Pb,Cu,Zn,Al,Ca,Mg;
010	Receiving Water Start	<i>6-10-20</i>	<i>0745</i>	<i>TW</i>	<i>G</i>	1	40	G	4 C	Water	N	TOC
011	Receiving Water Start	<i>6-10-20</i>	<i>0745</i>	<i>TW</i>	<i>G</i>	1	125	P	4 C	Water	N	Alk
012	Receiving Water Start	<i>6-10-20</i>	<i>0745</i>	<i>TW</i>	<i>G</i>	1	125	P	HNO3	Water	N	Metals Hard;
013	Receiving Water Start	<i>6-10-20</i>	<i>0745</i>	<i>TW</i>	<i>G</i>	1	125	P	H2SO4	Water	N	NH3;

Relinquished By: <i>DEwell</i>	Date: <i>6-10-20</i> Time: <i>0855</i>	Received By: <i>DW</i> <i>(mw)</i>	Date: <i>06/10/20</i> Time: <i>0855</i> Temp (C): Meter ID:
Relinquished By: <i>DW</i> <i>(mw)</i>	Date: Time:	Received at Lab By: <i>Potter</i>	Date: <i>06/10/20</i> Time: <i>1300</i> Temp (C): <i>3.9</i> Meter ID: <i>T-295</i>
Comments: <i>Receiving Water (Nashua River) sample was collected upstream of Effluent discharge pipe from Nashua River off of McPherson Rd.</i>			

COC Number: A1018825



CHAIN OF CUSTODY DOCUMENTATION

Client: Ayer, Ma WWTF	Contact: Paula Boyle	Project Name: Ayer, MA	Q2 2020
Report to: Paula Boyle	Address: Hoyle Tanner & Assoc Inc	Project Number: P0064	Task: 0001
Invoice to: Paula Boyle	Address: Manchester, NH 03101	Project Manager: Paula Boyle	
Voice: 603-669-5555	Fax: 603-669-4168	email: sewer@ayer.ma.us	P.O: '

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
014	Effluent First Renewal	6-11-20	0630	TW	C	1	3750	P	4 C	Water	N	CD7DCR 1stRenewal Sample
015	Effluent First Renewal	6-11-20	0630	TW	C	1	250	P	HNO3	Water	N	Total Metals Cd,Ni,Pb,Cu,Zn,Al,Ca,Mg;
016	Effluent First Renewal	6-11-20	0630	TW	C	1	40	G	4 C	Water	N	TOC
017	Effluent First Renewal	6-11-20	0630	TW	C	1	125	P	4 C	Water	N	Alk
018	Effluent First Renewal	6-11-20	0630	TW	C	1	125	P	HNO3	Water	N	Metals Hard;
019	Effluent First Renewal	6-11-20	0630	TW	C	1	125	P	H2SO4	Water	N	NH3;
020	Receiving Water First Renewal	6-12-20	0710	TW	G	1	3750	P	4 C	Water	N	CD7DCR 1stRenewal Diluent
021	Receiving Water First Renewal	6-12-20	0710	TW	G	1	125	P	4 C	Water	N	Alk
022	Receiving Water First Renewal	6-12-20	0710	TW	G	1	125	P	HNO3	Water	N	Metals Hard;
023	Receiving Water First Renewal	6-12-20	0710	TW	G	1	125	P	H2SO4	Water	N	NH3;

Relinquished By: <i>[Signature]</i>	Date: 6-12-20	Time: 0940	Received By: DW <i>[Signature]</i>	Date:	Time:	Temp (C):	Meter ID:
Relinquished By: DW <i>[Signature]</i>	Date:	Time:	Received at Lab By: <i>[Signature]</i>	Date: 06/12/20	Time: 0940	Temp (C): 2.7	Meter ID: T-295
Comments: Effluent composite collected in 30 minute intervals from 0700 6-11-20 through 0630 6-12-20. 48 total effluent grab samples taken over 24 hr effluent composite collection period.							

COC Number: A1018826

Receiving water (Nashua River) collected upstream of Effluent discharge pipe from Nashua River off of McPherson Rd.



CHAIN OF CUSTODY DOCUMENTATION

Client: Ayer, Ma WWTF	Contact: Paula Boyle	Project Name: Ayer, MA	02 2020
Report to: Paula Boyle	Address: Hoyle Tanner & Assoc Inc	Project Number: P0064	Task: 0001
Invoice to: Paula Boyle	Address: Manchester, NH 03101	Project Manager: Paula Boyle	
Voice: 603-669-5555	Fax: 603-669-4168	email: sewer@ayer.ma.us	P.O: '

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Pres- ervation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
024	Effluent Second Renewal	6-14 6-15	0700 0630	TLW	C	1	3750	P	4 C	Water	N	CD7DCR 2ndRenewal Sample
025	Effluent Second Renewal	6-14 6-15	0700 0630	TLW	C	1	250	P	HNO3	Water	N	Total Metals Cd,Ni,Pb,Cu,Zn,Al,Ca,Mg;
026	Effluent Second Renewal	6-14 6-15	0700 0630	TLW	C	1	40	G	4 C	Water	N	TOC
027	Effluent Second Renewal	6-14 6-15	0700 0630	TLW	C	1	125	P	4 C	Water	N	Alk
028	Effluent Second Renewal	6-14 6-15	0700 0630	TLW	C	1	125	P	HNO3	Water	N	Metals Hard;
029	Effluent Second Renewal	6-14 6-15	0700 0630	TLW	C	1	125	P	H2SO4	Water	N	NH3;
030	Receiving Water Second Renewal	6-15-20	0805	TLW	G	1	3750	P	4 C	Water	N	CD7DCR 2ndRenewal Diluent
031	Receiving Water Second Renewal	6-15-20	0805	TLW	G	1	125	P	4 C	Water	N	Alk
032	Receiving Water Second Renewal	6-15-20	0805	TLW	G	1	125	P	HNO3	Water	N	Metals Hard;
033	Receiving Water Second Renewal	6-15-20	0805	TLW	G	1	125	P	H2SO4	Water	N	NH3;

Relinquished By: *[Signature]* Date: 6-15-20 Time: 0815 Received By: *[Signature]* Date: 6-16-20 Time: 0815 Temp (C): Meter ID:

Relinquished By: *[Signature]* Date: 6-16-20 Time: 1235 Received at Lab By: *[Signature]* Date: 6-16-20 Time: 1235 Temp (C): 1.7C Meter ID: T-295

Comments: Effluent composite collected in 30 minute intervals from 0700 6-14-20 through 0630 6-15-20. 48 Total Effluent grab samples taken over 24 Hr. Effluent composite collection period.

Assay Review Checklist

DATE IN: 06/10/20

STUDY#: 34144

DATE DUE: 07/31/20

CLIENT: AYER

PROJECT:

ASSAY: CD48AD, CD7DCR

Project Paperwork Check for Completeness				
	Date	Analyst	Supervisor	Comments
Day 0	06/11/20	CMC	BG	CMC m-h-g
Day 1	06/12/20	CFS	BG	
Day 2	06/13/20	BG	BG	
Day 3	06/14/20	CMC	GRS	
Day 4	06/15/20	GRS	GRS	
Day 5	06/16/20	CFS	GRS	
Day 6	06/17/20	GRS	GRS	
Day 7	06/18/20	JTP	BG	
Day 8				

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete	06/24/20	BG	med DW initials
Sample Receipt Complete		↓	
Organism Culture Sheet(s)		NA	
Bench Sheets Complete (dates, times, initials, etc...)		BG	
Water Quality Data Complete		↓	
TRC Values & Bottle Numbers		↓	
Daphnid Calculations Complete		↓	
Weights Reported		NA	
Assay Acceptability Review	✓	Dr	

Technical Report Review	Date	Initials	Comments
Statistical Analysis Complete	6/19/20	MW	
Statistical Analysis Reviewed	6/23/20	MR	
Data Acceptability Review	6/24/20	MW	
Supporting Chemistry Report	6/29/20	MW	
Draft Report	6/22/20	MW	
QA Audit/Review Complete			
Final Report Reviewed	6/23/20	MR	
Final Report Printed - PDF	6/29/20	MW	
Executive Summary / Chems Sent			
Report E-mailed / Faxed	6/29/20	MW	
Report Logged Out / Invoice Sent			
Report Scanned to Archive	↓	↓	

Q:\Forms\Lab Forms\Archive and stuff that belongs in folder\Assay Review Checklist 06-13-19 Update.wpd

April 22, 2020

Ms. Paula Boyle
Hoyle, Tanner and Associates Inc.
150 Dow Street
Manchester, New Hampshire 03101

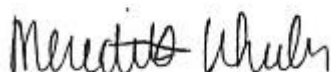
Dear Ms. Boyle:

Enclosed, please find a copy of our report evaluating results of toxicity tests completed on effluent samples collected from the Ayer, Massachusetts Wastewater Treatment Facility in March 2020. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

Please do not hesitate to call me should you have any questions regarding the report.

Sincerely,

Enthalpy Analytical, LLC



Meredith Wheeler
Project Manager

Enclosure

WET Test Report Certification
Report 33893-20-03
Email Only

Cc: Rick Hudson

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION

Permittee Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on:

Authorized Signature

Print or Type Name

Town of Ayer Board of Selectmen

Print or Type the Permittee's Name

MA0100013

Type or Print the NPDES Permit No.

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION (Bioassay Laboratory)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: April 22, 2020



Kirk Cram
Laboratory Director - Enthalpy Analytical, LLC



**TOXICOLOGICAL EVALUATION
OF A TREATED MUNICIPAL EFFLUENT
BIOMONITORING SUPPORT FOR A NPDES PERMIT:
March 2020**

Ayer Wastewater Treatment Facility
Ayer, Massachusetts
NPDES Permit Number MA0100013

Prepared For:

Hoyle, Tanner and Associates Inc.
150 Dow Street
Manchester, New Hampshire 03101

Prepared By:

Enthalpy Analytical, LLC
One Lafayette Road
Hampton, New Hampshire 03842

March 2020
Reference Number: Ayer33893-20-03

STUDY NUMBER 33893

EXECUTIVE SUMMARY

The following summarizes the results of acute and chronic exposure bioassays performed during March 2020 using samples collected from the Ayer, Massachusetts Wastewater Treatment Facility. Samples were provided by Civil and Environmental Consultants, Inc., Raynham, Massachusetts. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

C. dubia, cultured at Enthalpy, were <24 hours old juveniles. Dilution water was receiving water collected from the Nashua River upstream of the discharge. Samples were received under chain of custody in good order. All sample receipt, test conditions and control endpoints were within protocol specifications, except where otherwise noted.

The results presented in this report relate only to the samples described on the chain(s) of custody and sample receipt log(s), and are to be used only by the submitter. Results from the chronic and modified acute exposure assays and their relationship to permit limits are summarized in the following matrix.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Effluent Meets Permit Limit	Assay Meets Protocol Limits
<i>Ceriodaphnia dubia</i> ^a	48 Hours	>100%	NC	≥100%	Yes	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	IC-25	Permit Limit (C-NOEC)	Effluent Meets Permit Limit	Assay Meets Protocol Limits
<i>Ceriodaphnia dubia</i>	7 Days	100%	NC	≥7.7%	Yes	Yes

COMMENTS:

NC = Not Calculated.

^a 4 daphnids were found in replicate A of the 6.25% and no daphnids were present in replicate B of the 12.5% test concentration on day 1, therefore 4 organisms will be used from initiation of the assay in replicate A of the 6.25% test concentration and replicate B will be excluded for data summary purposes in the 12.5% test concentration.

**TOXICOLOGICAL EVALUATION
OF A TREATED MUNICIPAL EFFLUENT
BIOMONITORING SUPPORT FOR A NPDES PERMIT:
March 2020**

Ayer Wastewater Treatment Facility
Ayer, Massachusetts
NPDES Permit Number MA0100013

1.0 INTRODUCTION

This report presents the results of toxicity tests completed on a series of composite effluent samples collected from the Ayer, Massachusetts Wastewater Treatment Facility (Ayer WWTF). Samples were provided by Civil and Environmental Consultants, Inc., Raynham, Massachusetts. Testing was based on programs and protocols developed by the US EPA (2002), with exceptions as noted by US EPA Region I (2011, 2013), and involved conducting acute and chronic toxicity tests with the daphnid, *Ceriodaphnia dubia*. Testing was conducted at Enthalpy Analytical, LLC (Enthalpy), Hampton, New Hampshire in accordance with the provisions of TNI Standards (2009).

Acute toxicity tests involve preparing a series of test concentrations by diluting effluent with control water. Groups of test organisms are exposed to each test concentration and control for a specified period. The mortality data for each concentration can be used to calculate the median lethal concentration or LC-50, defined as the concentration of effluent that kills half of the test organisms. Samples with a high LC-50 value are less likely to cause significant environmental impacts. These data can also be analyzed to determine the no effect level. This Acute No Observed Effect Concentration (A-NOEC) is defined as the highest tested effluent concentration that causes no significant mortality. Chronic toxicity tests measure sublethal effects, exposing test organisms to samples during a sensitive period in the life cycle. Daphnid chronic tests measure survival and juvenile production. Using Analysis of Variance techniques to evaluate the data, it is possible to determine the lowest tested concentration that had an effect (C-LOEC) and the highest tested concentration where no effect (C-NOEC) was observed. An Inhibition Concentration (IC) may be calculated by linear interpolation to confirm the C-NOEC in situations where a non-standard dose-response or sample toxicity are encountered. The IC-25 is calculated to best approximate the C-NOEC (US EPA 2000).

2.0 MATERIALS AND METHODS

2.1 General Methods

Toxicological and analytical protocols used in this program follow procedures primarily designed to provide standard approaches for the evaluation of toxicological effects of discharges on aquatic organisms (US EPA 2002), and for the analysis of water samples (APHA 2012). See Section 4.0 for a list of references.

2.2 Test Species

C. dubia were maintained in laboratory water at 25±1°C with a photoperiod of 16:8 hours light:dark. Cultures are fed daily with a yeast/trout chow/Cerophyll or alfalfa leaves (YTC) mixture supplemented with *Pseudokirchneriella subcapitata* (algae) (US EPA 2002). Adults on a brood board were isolated 24 hours prior to test start and allowed to reproduce for 8 hours.

2.3 Effluent, Receiving Water, and Laboratory Water

Effluent and receiving water collection information is provided in Table 1. Samples were received at 0-6°C as per 40 CFR §136.3 unless otherwise noted, stored at 4±2°C and warmed to 25±1°C prior to preparing test solutions. Laboratory water was synthetic reconstituted water prepared at Enthalpy according to protocol (US EPA 2002). This water has been used to successfully culture freshwater organisms since 1992.

Total residual chlorine (TRC) was measured by amperometric titration (MDL 0.02 mg/L) in the effluent samples prior to use in the assays. Samples with ≥ 0.02 mg/L TRC were dechlorinated using sodium thiosulfate (US EPA 2002) and a control treatment using laboratory water adjusted with the same amount of sodium thiosulfate used to dechlorinate the effluent was run concurrently with the assay. If sample pH measured < 6.0 SU or > 9.0 SU, samples were adjusted using sodium hydroxide or hydrochloric acid, respectively, and a control treatment using laboratory water adjusted with the same amount of either compound used to modify sample pH was run concurrently with the assay. When applicable, data from sodium thiosulfate and/or pH adjusted laboratory control treatments can be found in Appendix A.

2.4 Acute Exposure Bioassay

The 48-hour static acute assay was conducted at $25 \pm 1^\circ\text{C}$ with a photoperiod of 16:8 hours light:dark. Test concentrations were 100% (undiluted), 50%, 25%, 12.5%, and 6.25% effluent. Daphnids were maintained in 30 mL test chambers with approximately 20 mL of test solution in each of 4 replicates with 5 organisms/replicate. Test organisms were derived from a pool of mixed organisms recovered from Enthalpy's culture the morning of testing. All organisms used were recovered from the same type of culture water.

Survival in all test replicates was recorded daily. A fifth replicate in the daphnid assay was included as a surrogate test chamber to obtain daily water qualities without disturbing the test animals, and was treated the same as actual test chambers with the addition of animals and food, but was not used to determine endpoint data. Dissolved oxygen, pH and temperature were measured daily, and specific conductivity was measured at the start of the assay.

2.5 Chronic Exposure Bioassay

The chronic exposure bioassays were conducted according to protocol (US EPA 2002), which called for the daily renewal of test solutions. Test treatments for the assays were 100% (undiluted), 50%, 25%, 12.5%, 7.7%, and 6.25% effluent. Dissolved oxygen, pH, specific conductivity and temperature were measured in one replicate of each new and old test solution.

Test chambers for the daphnid assay were 30 mL portion cups containing approximately 20 mL of test solution in each of 10 replicates with 1 organism/replicate. Replicates were not randomized during testing; rather, organisms were added at test initiation by blocking by known parentage. Survival and juvenile production were monitored daily. Daphnids were each fed 200 μL of a mixture of YTC and algae after daily renewals.

2.6 Data Analysis

Statistical analysis of acute and chronic exposure data was completed using CETIS™ v1.9.6.3, Comprehensive Environmental Toxicity Information System, software. The program computes acute and chronic exposure endpoints based on US EPA decision tree guidelines specified in individual test methods. If survival in the highest test concentration is $> 50\%$, the LC-50 is obtained by direct observation of the raw data. As needed, the A-NOEC is determined as the highest test concentration that caused no significant mortality. For chronic exposure endpoints statistical significance was accepted at $\alpha = 0.05$. For statistical calculations of *C. dubia* juvenile production, data from only the first three broods are used.

2.7 Quality Control

As part of the laboratory quality control program, reference toxicant evaluations are completed on a regular basis for each test species. These results provide regular laboratory performance evaluation through the comparison of historic data sets. See Table 2 for details.

3.0 RESULTS AND DISCUSSION

Results of the acute exposure assay completed using *C. dubia* are presented in Table 3, and chronic results can be found in Table 4. Water quality data collected during the assays are summarized in Table 5. US EPA Region I Attachment F toxicity test summary sheets are provided after the tables. Support data, including copies of laboratory bench sheets, are provided in Appendix A.

3.1 Acute Exposure Bioassay - *Ceriodaphnia dubia*

Minimum test acceptability criteria require $\geq 90\%$ survival in the control concentrations. Achievement of these results indicates that healthy test organisms were used and that the dilution water had no significant adverse impact on the outcome of the assay. See the Executive Summary and Table 3 for test acceptability.

3.2 Chronic Exposure Bioassay – *Ceriodaphnia dubia*

Minimum test acceptability criteria require 80% control survival, mean reproduction of 15 juveniles/female, production of 3 broods by at least 60% of control females, and the MSDp for reproduction to be 13-47% for *Ceriodaphnia dubia* (US EPA 2002). Achievement of these results indicates that healthy test organisms were used and that the dilution water had no significant adverse impact on the outcome of the assay. See the Executive Summary and Table 4 for test acceptability.

4.0 LITERATURE CITED

- 40 CFR §136.3. *Code of Federal Regulations* (CFR), Protection of the Environment (Title 40), Guidelines Establishing Test Procedures for the Analysis of Pollutants (Part 136), Identification of Test Procedures (sub-part 3), Table II-Required Containers, Preservation Techniques, and Holding Times.
- APHA. 2012. *Standard Methods for the Examination of Water and Wastewater*, 22nd Edition. Washington D.C.
- The NELAC Institute (TNI). 2009. *Environmental Laboratory Sector, Volume 1: Management and Technical Requirements for Laboratories Performing Environmental Analysis (TNI Standard)*. EL-V1-2009.
- US EPA. 2000. *Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing (40 CFR Part 136)*. EPA 821-B-00-004.
- US EPA. 2002. *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms*. Fifth Edition. EPA-821-R-02-012.
- US EPA. 2002. *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*. Fourth Edition. EPA-821-R-02-013.
- US EPA Region I. 2011. *US EPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol*. US EPA Region I Office, Boston, Massachusetts. February 28, 2011.
- US EPA Region I. 2013. *Freshwater Chronic Toxicity Test Procedure and Protocol - US EPA Region I*. US EPA Region I Office, Boston, Massachusetts. December 2013.

**TABLE 1. Sample Collection Information. Evaluation. March 2020.
Ayer WWTF Effluent Evaluation. March 2020.**

Sample Description	Type	Collection Date	Collection Time	Receipt Date	Receipt Time	Receipt Temp °C
EFFLUENT						
Start	Comp	03/10-11/20	0720-0650	03/11/20	1425	0
First Renewal	Comp	03/12-13/20	0700-0630	03/13/20	0800	0
Second Renewal	Comp	03/15-16/20	0700-0630	03/16/20	0915	2
RECEIVING WATER						
Start	Grab	03/11/20	0845	03/11/20	1425	0
First Renewal	Grab	03/13/20	0745	03/13/20	0800	0
Second Renewal	Grab	03/16/20	0815	03/16/20	0915	2

**TABLE 2. *C. dubia* Reference Toxicant Data.
Ayer WWTF Effluent Evaluation. March 2020.**

Date	Organism Lot	Endpoint	Value	Historic Mean/Tendency	Acceptable Range	Reference Toxicant
<i>C. dubia</i>						
02/20/20	00CdEAH022020	Survival LC-50	26.9	25.6	9.9 – 41.3	SDS (mg/L)
02/27/20	00CdEAH022720	Survival C-NOEC	30.0	30.0	15.0 – 60.0	Copper (µg/L)
02/27/20	00CdEAH022720	Reproduction C-NOEC	15.0	15.0	7.5 – 30.0	Copper (µg/L)
02/27/20	00CdEAH022720	Reproduction MSDp	38.8	29.6	11.2 – 48.0	Copper (µg/L)

Means and Acceptable Ranges based on the 20 most recent reference toxicant assays.

**TABLE 3. *C. dubia* Acute Exposure Assay Data Summary.
Ayer WWTF Effluent Evaluation. March 2020.**

Species	Exposure	LAB	Percent Survival					100%
			RW	6.25% ^a	12.5% ^a	25%	50%	
<i>C. dubia</i>	48 Hours	100%	100%	100%	100%	100%	100%	100%

Species	Exposure	LC-50 and A-NOEC Results			
		Spearman-Kärber	Linear Interpolation	Direct Observation	A-NOEC
<i>C. dubia</i>	48 Hours	NC	NC	>100%	NC

COMMENTS:

NC = Not Calculated.

RW = Receiving Water; used as the diluent.

^a 4 daphnids were found in replicate A of the 6.25% and no daphnids were present in replicate B of the 12.5% test concentration on day 1, therefore 4 organisms will be used from initiation of the assay in replicate A of the 6.25% test concentration and replicate B will be excluded for data summary purposes in the 12.5% test concentration.

**Table 4. *C. dubia* Chronic Exposure Assay Data Summary.
Ayer WWTF Effluent Evaluation. March 2020.**

Effluent Conc.	Mean Percent Survival Day 7	Mean Reproduction (Juv/Female)	% Females Producing 3 Broods	Is There a Significant Difference Based on	
				Survival (%)	Reproduction
LAB	100%	30.5	90%	-	-
RW	100%	31.9	90%	-	-
6.25%	100%	28.3	80%	No	No
7.7%	100%	33.7	100%	No	No
12.5%	100%	36.1	80%	No	No
25.0%	90%	29.0	66.7%	No	No
50.0%	100%	35.9	70%	No	No
100.0%	100%	28.8	70%	No	No

MSDp = 41.7%

NOEC = 100% NOEC = 100%

COMMENTS:

RW = Receiving Water; used as the diluent.

**TABLE 4. WET Support Chemistry Data.
Ayer WWTF Effluent Evaluation. March 2020.**

PARAMETER	UNITS	EFFLUENT	RECEIVING WATER
Specific Conductivity	µmhos/cm	1258	340
pH	SU	7.74	6.92
Total Residual Chlorine	mg/L	<0.02	-
Alkalinity	mg/L	210	22
Hardness	mg/L	180	43
Total Solids	mg/L	750	-
Total Dissolved Solids	mg/L	740	-
Ammonia	mg/L as N	1.03	<0.1
Total Organic Carbon	mg/L	10.5	3.2
Aluminum, total	mg/L	<0.02	0.063
Cadmium, total	mg/L	<0.0003	<0.0003
Calcium, total	mg/L	58.8	12.9
Copper, total	mg/L	0.0068	0.0022
Lead, total	mg/L	<0.0003	0.0009
Magnesium, total	mg/L	9.39	2.45
Nickel, total	mg/L	0.0042	<0.002
Zinc, total	mg/L	0.032	0.012

COMMENTS:

Additional water quality and analytical support data are provided in Appendix A.

TOXICITY TEST SUMMARY SHEET

FACILITY NAME:	Ayer WWTF	TEST START DATE:	03/12/20
NPDES PERMIT NO.:	MA0100013	TEST END DATE:	03/14/20

TEST TYPE	TEST SPECIES	SAMPLE TYPE	SAMPLE METHOD
<input checked="" type="checkbox"/> Acute	<input type="checkbox"/> <i>Pimephales promelas</i>	<input type="checkbox"/> Prechlorinated	<input type="checkbox"/> Grab
<input type="checkbox"/> Chronic	<input checked="" type="checkbox"/> <i>Ceriodaphnia dubia</i>	<input type="checkbox"/> Dechlorinated	<input checked="" type="checkbox"/> Composite
<input type="checkbox"/> Modified Chronic (Reporting Acute Values)	<input type="checkbox"/> <i>Daphnia pulex</i>	<input type="checkbox"/> Chlorine Spiked in Lab	<input type="checkbox"/> Flow-thru
<input type="checkbox"/> 24 Hour Screen	<input type="checkbox"/> <i>Americamysis bahia</i>	<input type="checkbox"/> Chlorinated on Site	<input type="checkbox"/> Other
	<input type="checkbox"/> <i>Cyprinodon variegatus</i>	<input type="checkbox"/> Unchlorinated	
	<input type="checkbox"/> <i>Menidia beryllina</i>	<input checked="" type="checkbox"/> No Detectable Chlorine Upon Receipt	
	<input type="checkbox"/> <i>Arbacia punctulata</i>		

DILUTION WATER:

☒ Receiving water collected at a point upstream or away from the discharge, free from toxicity or other sources of contamination; Receiving Water Name: Nashua River

☐ Alternate surface water of known quality and hardness, to generally reflect the characteristics of the receiving water; Receiving Water Name: _____

☐ Synthetic water prepared using either Millipore Milli-Q or equivalent deionized water and reagent grade chemicals; or deionized water combined with mineral water.

☐ Artificial sea salts mixed with deionized water

☐ Deionized water and hypersaline brine

☐ Other

EFFLUENT SAMPLING DATES: 03/10-11/20

EFFLUENT CONCENTRATIONS TESTED (%): 100, 50, 25, 12.5, 6.25

Permit Limit Concentration: ≥100% %

Was the effluent salinity adjusted? No If yes, to what level? - ppt

REFERENCE TOXICANT TEST DATE: 03/25/20 LC-50: 14.7 mg/L Sodium Dodecyl Sulfate

PERMIT LIMITS AND TEST RESULTS

Test Acceptability Criteria

Mean Diluent Control Survival: 100 %

LIMITS

LC-50: 100 %

A-NOEC: - %

RESULTS

LC-50	<u>>100</u> %
Upper Limit:	<u>-</u> %
Lower Limit:	<u>-</u> %
Method:	<u>Direct Observation</u>
A-NOEC	<u>-</u> %

TOXICITY TEST SUMMARY SHEET

FACILITY NAME:	Ayer WWTF	TEST START DATE:	03/12/20
NPDES PERMIT NO.:	MA0100013	TEST END DATE:	03/19/20

TEST TYPE	TEST SPECIES	SAMPLE TYPE	SAMPLE METHOD
<input type="checkbox"/> Acute	<input type="checkbox"/> <i>Pimephales promelas</i>	<input type="checkbox"/> Prechlorinated	<input type="checkbox"/> Grab
<input checked="" type="checkbox"/> Chronic	<input checked="" type="checkbox"/> <i>Ceriodaphnia dubia</i>	<input type="checkbox"/> Dechlorinated	<input checked="" type="checkbox"/> Composite
<input type="checkbox"/> Modified Chronic (Reporting Acute Values)	<input type="checkbox"/> <i>Daphnia pulex</i>	<input type="checkbox"/> Chlorine Spiked in Lab	<input type="checkbox"/> Flow-thru
<input type="checkbox"/> 24 Hour Screen	<input type="checkbox"/> <i>Americamysis bahia</i>	<input type="checkbox"/> Chlorinated on Site	<input type="checkbox"/> Other
	<input type="checkbox"/> <i>Cyprinodon variegatus</i>	<input type="checkbox"/> Unchlorinated	
	<input type="checkbox"/> <i>Menidia beryllina</i>	<input checked="" type="checkbox"/> No Detectable Chlorine Upon Receipt	
	<input type="checkbox"/> <i>Arbacia punctulata</i>		

DILUTION WATER:

☒ Receiving water collected at a point upstream or away from the discharge, free from toxicity or other sources of contamination; Receiving Water Name: Nashua River

☐ Alternate surface water of known quality and hardness, to generally reflect the characteristics of the receiving water; Receiving Water Name: _____

☐ Synthetic water prepared using either Millipore Milli-Q or equivalent deionized water and reagent grade chemicals; or deionized water combined with mineral water.

☐ Artificial sea salts mixed with deionized water

☐ Deionized water and hypersaline brine

☐ Other

EFFLUENT SAMPLING DATES: 03/10-11/20 03/12-13/20 03/15-16/20

EFFLUENT CONCENTRATIONS TESTED (%): 100, 50, 25, 12.5, 7.7, 6.25

Permit Limit Concentration: ≥7.7 %

Was the effluent salinity adjusted? No If yes, to what level? - ppt

REFERENCE TOXICANT TEST DATE: 03/17/20 NOEC: 30.0 µg/L Copper

PERMIT LIMITS AND TEST RESULTS

Test Acceptability Criteria

Mean Diluent Control Survival: 90 %

Mean # Juveniles/Female: 31.9
MSDp 41.7 %

LIMITS

C-NOEC: ≥7.7 %

IC - - %

RESULTS

C – NOEC: 100 %

C – LOEC: >100 %

IC - - %

APPENDIX A
DATA SHEETS
STATISTICAL SUPPORT

Contents	Number of Pages
Methods Used in NPDES Permit Biomonitoring Testing	1
Massachusetts DEP Accreditation Certification and Certified Parameter List	2
<u>Acute Exposure Bioassay</u>	
<i>C. dubia</i> Acute Bioassay Bench Sheet	1
<i>C. dubia</i> Acute Reference Toxicant Analysis	1
<u>Chronic Exposure Bioassay</u>	
<i>C. dubia</i> Chronic Reproduction Assay Bench Sheets	2
<i>C. dubia</i> Reference Toxicant Analysis	3
<i>C. dubia</i> Survival and Reproduction Statistical Analysis	6
<i>C. dubia</i> Blocking by Parentage Tracking Sheet	1
Water Quality Bench Sheets	2
Preparation of Dilutions and Record of Meters Used	4
Analytical Chemistry Support Data Summary Report	2
Sample Receipt Record	1
Chain of Custody	4
Assay Review Checklist	1
 Total Appendix Pages	 31

METHODS USED IN NPDES PERMIT BIOMONITORING TESTING

Parameter	Method
Acute Exposure Bioassays:	
<i>Ceriodaphnia dubia</i>	EPA-821-R-02-012 2002.0
<i>Daphnia pulex</i>	EPA-821-R-02-012 2021.0
<i>Pimephales promelas</i>	EPA-821-R-02-012 2000.0
<i>Americamysis bahia</i>	EPA-821-R-02-012 2007.0
<i>Menidia beryllina</i>	EPA-821-R-02-012 2006.0
<i>Cyprinodon variegatus</i>	EPA-821-R-02-012 2004.0
Chronic Exposure Bioassays:	
<i>Ceriodaphnia dubia</i>	EPA-821-R-02-013 1002.0
<i>Pimephales promelas</i>	EPA-821-R-02-013 1000.0
<i>Cyprinodon variegatus</i>	EPA-821-R-02-014 1004.0
<i>Menidia beryllina</i>	EPA-821-R-02-014 1006.0
<i>Arbacia punctulata</i>	EPA-821-R-02-014 1008.0
<i>Champia parvula</i>	EPA-821-R-02-014 1009.0
Trace Metals:	
Trace Metals	EPA 200.8/SW 6020, EPA 245.7
Hardness	EPA SW846 3rd Ed. 6010
Wet Chemistries:	
Alkalinity	EPA 310.2
Chlorine, Residual	Standard Methods 22 nd Edition - Method 4500-Cl D
Total Organic Carbon	Standard Methods 22 nd Edition - Method 5310 C
Specific Conductance	Standard Methods 22 nd Edition - Method 2510 B
Nitrogen - Ammonia	Standard Methods 22 nd Edition - Method 4500-NH ₃ G
pH	Standard Methods 22 nd Edition - Method 4500-H+ B
Solids, Total (TS)	Standard Methods 22 nd Edition - Method 2540 B
Solids, Total Dissolved (TDS)	Standard Methods 22 nd Edition - Method 2540 C
Solids, Total Suspended (TSS)	Standard Methods 22 nd Edition - Method 2540 D
Dissolved Oxygen	Standard Methods 22 nd Edition - Method 4500-O G

Please visit our web site at www.enthalpy.com/accreditations for a copy of our accreditations and state certifications.

The Commonwealth of Massachusetts



Department of Environmental Protection

Division of Environmental Laboratory Sciences

Senator William X. Wall Experiment Station

certifies

M-NH906

**ENTHALPY ANALYTICAL, LLC
1 LAFAYETTE RD
HAMPTON, NH 03842-0000**

Laboratory Director: **JASON HOBBS**

for the analysis of **NON POTABLE WATER (CHEMISTRY)**

pursuant to 310 CMR 42.00

This certificate supersedes all previous Massachusetts certificates issued to this laboratory. The laboratory is regulated by and shall be responsible for being in compliance with Massachusetts regulations at 310 CMR 42.00.

This certificate is valid only when accompanied by the latest dated Certified Parameter List as issued by the Massachusetts D.E.P. Contact the Division of Environmental Laboratory Sciences to verify the current certification status of the laboratory.

Certification is no guarantee of the validity of the data. This certification is subject to unannounced laboratory inspections.

A handwritten signature in dark ink, appearing to read "Oscar C. Pascual".

Director, Division of Environmental Laboratory Sciences

Issued: **01 JUL 2019**

Expires: **30 JUN 2020**

**COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

Certified Parameter List as of: **02 AUG 2019**

**M-NH906 ENTHALPY ANALYTICAL, LLC
HAMPTON NH**

NON POTABLE WATER (CHEMISTRY)	Effective Date	02 AUG 2019	Expiration Date	30 JUN 2020
<u>Analytes</u>			<u>Methods</u>	
ALUMINUM			EPA 200.8	
ANTIMONY			EPA 200.8	
ARSENIC			EPA 200.8	
BERYLLIUM			EPA 200.8	
CADMIUM			EPA 200.8	
CHROMIUM			EPA 200.8	
COBALT			EPA 200.8	
COPPER			EPA 200.8	
IRON			EPA 200.8	
LEAD			EPA 200.8	
MANGANESE			EPA 200.8	
MERCURY			EPA 245.7	
MOLYBDENUM			EPA 200.8	
NICKEL			EPA 200.8	
SELENIUM			EPA 200.8	
SILVER			EPA 200.8	
THALLIUM			EPA 200.8	
VANADIUM			EPA 200.8	
ZINC			EPA 200.8	
PH			SM 4500-H-B	
SPECIFIC CONDUCTIVITY			SM 2510B	
TOTAL DISSOLVED SOLIDS			SM 2540C	
ALKALINITY, TOTAL			EPA 310.2	
CHLORIDE			EPA 300.0	
SULFATE			EPA 300.0	
AMMONIA-N			SM 4500-NH3-B, G	
NITRATE-N			SM 4500-NO3-F	
KJELDAHL-N			SM 4500-NH3-B, G	
ORTHOPHOSPHATE			SM 4500-P-E	
PHOSPHORUS, TOTAL			SM 4500-P-B,E	
BIOCHEMICAL OXYGEN DEMAND			SM 5210B	
NON-FILTERABLE RESIDUE			SM 2540D	
OIL AND GREASE			EPA 1664	

STUDY:
33893

CLIENT: Ayer

SAMPLE: Effluent

DILUENT: Receiving Water

SPECIES: *C. dubia*

LOT ID: 00C8EAH031220

AGE: <24 Hours

Treatment	Rep	SURVIVAL			DO (mg/L)			pH (SU)			Temp (°C)			S/C (µmhos/cm)	Sample Chemistries	
		0	24	48	0	24	48	0	24	48	0	24	48	0		
Lab	Surr.	5	5	5	8.7	8.7	8.4	7.61	7.96	8.06	23	21	21	217	T. Metals:	002
	A	5	5	5											TOC:	003
	B	5	5	5											Alk.:	004
	C	5	5	5											Hard.:	005
	D	5	5	5											NH3:	006
Receiving Water	Surr.	5	5	5	9.2	8.7	8.4	7.01	7.73	7.91	23	21	21	345	TS/TDS:	007
	A	5	5	5											Batch Used	
	B	5	5	5												
	C	5	5	5											Selenastrum:	
	D	5	5	5											A-5891	
6.25%	Surr.	5	4	4	9.1	8.7	8.9	7.28	7.86	7.97	23	21	21	415	YCT: F141	
	A	5	4	4												
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
12.5%	Surr.	5	5	5	9.1	8.7	8.9	7.42	7.99	8.06	23	21	21	463		
	A	5	5	5												
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
25%	Surr.	5	5	5	9.0	8.8	9.0	7.58	8.04	8.25	23	21	21	554		
	A	5	5	5												
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
50%	Surr.	5	5	4	9.1	8.8	8.9	7.74	8.32	8.49	23	21	21	801		
	A	5	5	5												
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
100%	Surr.	5	7	8	9.1	8.7	8.7	7.89	8.60	8.69	23	21	21	1268		
	A	5	5	5												
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												

INC TEMP (°C)

25

25

24

25

25

24

DATE

03/17/20

03/13/20

03/14

03/17/20

03/13/20

03/14

TIME

1235

1550

1435

1235

1505

1255

INITIALS

CA

CA

CFG

CA

CA

CA

E10

STANDARD REFERENCE TOXICANT ANALYSIS

Exposure: Acute - 48 Hours

Species: *Ceriodaphnia dubia*

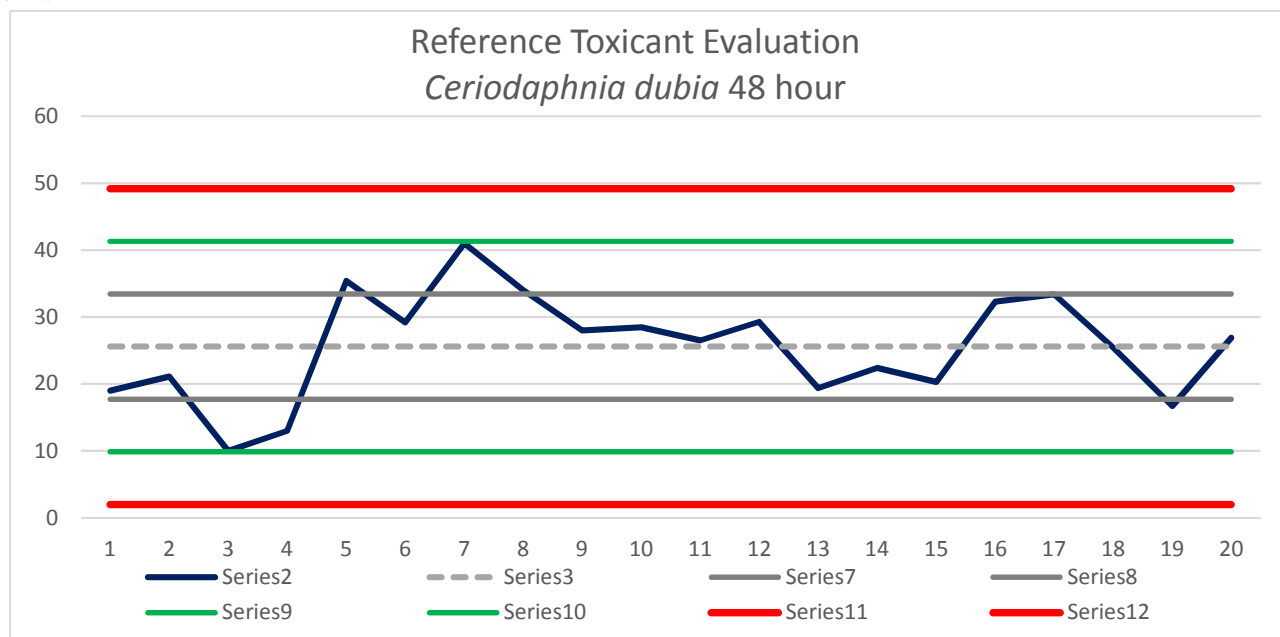
Toxicant: SDS

Temperature: 25C

Long Term Mean: 25.59 mg/L SDS

Long Term CV: 31%

Date		LC-50	Mean	Std Dev	2 Std Dev	CV	Mean -1 Std	Mean +1 Std	Mean -2 Std	Mean +2 Std	Mean -3 Std	Mean +3 Std
8/30/2018	1	19	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18
9/5/2018		21.1	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18
10/2/2018		10	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18
11/27/2018		13	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18
12/4/2018	5	35.4	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18
1/15/2019		29.2	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18
2/19/2019		41	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18
3/19/2019		34	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18
4/23/2019		28	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18
4/30/2019	10	28.5	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18
6/4/2019		26.5	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18
6/26/2019		29.3	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18
7/25/2019		19.4	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18
8/1/2019		22.4	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18
9/5/2019	15	20.3	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18
10/1/2019		32.3	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18
11/21/2019		33.4	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18
12/3/2019		25.4	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18
1/23/2020		16.7	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18
2/20/2020	20	26.9	25.59	7.86	15.73	30.73	17.73	33.45	9.86	41.32	2.00	49.18



Issued by:

Reviewed by:

Ayer Massachusetts WWTF Effluent Evaluation, March 2020.
Study Numbers 33893.

Data Appendix Page 5

Chironomid Reproduction Assay

STUDY #	CONC.	DAY	A	B	C	D	E	F	G	H	I	J	SUM	SURV.	
33893	MSR	0	+	+	+	+	+	+	+	+	+	+	0	10	
CLIENT: AYER WWTF		1	+	+	+	+	+	+	+	+	+	+	0	10	
SAMPLE: EFFLUENT		2	+	+	+	+	+	+	+	+	+	+	0	10	
DILUENT: Receiving Water		3	+	+	+	+	+	+	+	+	+	+	0	10	
Ceriodaphnia dubia source: MSR <input checked="" type="checkbox"/> MHR <input checked="" type="checkbox"/> collected: previous pm <input type="checkbox"/> test day am <input checked="" type="checkbox"/>		4	9	4	6	5	6	7	6	6	7	+	56	10	
		5	+	+	+	+	+	+	+	+	+	+	0	10	
		6	15	8	7	10	12	10	10	7	12	+	91	10	
		7	22	15	12	17	19	22	10	14	21	+	158	10	
8															
TOTAL		46	27	25	32	37	39	32	27	40	0	305	10		
DAY 0 03/12/20 TIME: 1500 FED: HED	RW	0	+	+	+	+	+	+	+	+	+	+	0	10	
DAY 1 03/13/20 TIME: 1805 FED: CA		1	+	+	+	+	+	+	+	+	+	+	0	10	
DAY 2 03/14/20 TIME: 1700 FED: BG		2	+	+	+	+	+	+	+	+	+	+	0	10	
DAY 3 03/15/20 TIME: 1315 FED: HED		3	+	+	+	+	+	+	+	+	+	+	0	10	
DAY 4 03/16/20 TIME: 1420 FED: GRS		4	8	5	5	6	6	5	5	5	7	+	52	10	
DAY 5 03/17/20 TIME: 1215 FED: MW		5	+	+	+	+	+	+	+	+	+	+	0	10	
DAY 6 03/18/20 TIME: 1515 FED: W		6	12	10	6	9	10	14	16	9	12	+	98	10	
DAY 7 03/19/20 TIME: 1525 FED: HED		7	25	15	14	18	17	23	18	14	25	+	169	10	
DAY 8 TIME: FED:		8													
TOTAL	45	30	25	33	33	42	39	28	44	0	319	10			
6.25%	0	+	+	+	+	+	+	+	+	+	+	+	0	10	
	1	+	+	+	+	+	+	+	+	+	+	+	0	10	
	2	+	+	+	+	+	+	+	+	+	+	+	0	10	
	3	+	+	+	+	+	+	+	+	+	+	+	0	10	
	4	8	4	5	+	4	6	6	6	5	+	44	10		
	5	+	+	+	+	+	+	+	+	+	+	0	10		
	6	14	8	10	+	7	12	12	13	14	+	90	10		
	7	25	14	13	+	16	22	25	15	19	+	149	10		
	8														
TOTAL	47	26	28	0	27	40	43	34	38	0	283	10			
LEGEND: + = LIVE - = DEAD ♂ = MALE M = MISSING Calculations: Initials: Mw Date: 3/23/20	7.7%	0	+	+	+	+	+	+	+	+	+	+	+	0	10
		1	+	+	+	+	+	+	+	+	+	+	+	0	10
		2	+	+	+	+	+	+	+	+	+	+	+	0	10
		3	+	+	+	+	+	+	+	+	+	+	+	0	10
		4	8	4	5	6	6	5	5	6	7	7	59	10	
		5	+	+	+	+	+	+	+	+	+	+	0	10	
		6	10	10	7	11	10	12	14	14	15	3	106	10	
		7	24	13	10	19	17	19	19	18	22	11	162	10	
		8													
		TOTAL	42	27	22	36	33	36	38	38	44	21	337	10	

90

90

80

100

STUDY #	CONC.	DAY	A	B	C	D	E	F	G	H	I	J	SUM	SURV.
33893	12.5%	0	+	+	+	+	+	+	+	+	+	+	0	10
CLIENT: AYER WWTF		1	+	+	+	+	+	+	+	+	+	+	0	10
SAMPLE: Effluent		2	+	+	+	+	+	+	+	+	+	+	0	10
		3	+	+	+	+	+	+	+	+	+	+	0	10
		4	7	3	6	6	4	5	6	7	6	6	56	10
DILUENT: Receiving Water		5	+	+	+	+	+	+	+	+	+	+	0	10
		6	17	1	11	16	14	14	13	10	14	+	110	10
		7	25	18	15	11	21	21	23	14	24	23	195	10
Cerio Data source: MSR <input checked="" type="checkbox"/> MHR <input checked="" type="checkbox"/> collected: previous pm <input type="checkbox"/> test day am <input checked="" type="checkbox"/>		8												
		TOTAL	49	22	32	33	39	40	42	31	44	29	361	10
DAY 0 03/12/20 TIME: 1500 FED: HED DAY 1 03/13/20 TIME: 1805 FED: CA DAY 2 03/14/20 TIME: 1700 FED: DG DAY 3 03/15/20 TIME: 1315 FED: HED DAY 4 03/16/20 TIME: 1420 FED: GRS	25%	0	+	+	+	+	+	+	+	+	+	+	0	10
		1	+	+	+	+	+	+	+	+	+	+	0	10
		2	+	+	+	+	+	+	+	+	+	+	0	10
		3	+	+	+	+	+	+	+	+	+	+	0	10
		4	8	6	7	5	5	6	4	6	6	+	53	10
		5	+	+	+	+	+	+	+	+	-	+	0	9
		6	18	+	10	13	1	12	16	9	+	+	79	9
		7	26	16	12	24	20	25	21	14	+	+	150	9
		8									↓			
		TOTAL	52	22	29	42	26	43	41	29	6	0	290	9
DAY 5 3/17/20 TIME: 1215 FED: MW DAY 6 03/18/20 TIME: 1515 FED: W DAY 7 03/19/20 TIME: 1525 FED: HED DAY 8 TIME: FED:	50%	0	+	+	+	+	+	+	+	+	+	+	0	10
		1	+	+	+	+	+	+	+	+	+	+	0	10
		2	+	+	+	+	+	+	+	+	+	+	0	10
		3	+	+	+	+	+	+	+	+	+	+	0	10
		4	7	5	6	3	5	6	6	4	8	6	56	10
		5	+	+	+	+	+	+	+	+	+	+	0	10
		6	13	1	10	17	1	18	13	8	18	+	99	10
		7	22	15	15	16	23	25	23	16	25	24	204	10
		8												
		TOTAL	42	21	31	36	29	49	42	29	51	30	359	10
LEGEND: + = LIVE - = DEAD ♂ = MALE M = MISSING Calculations: Initials: MW Date: 3/23/20	100%	0	+	+	+	+	+	+	+	+	+	+	0	10
		1	+	+	+	+	+	+	+	+	+	+	0	10
		2	+	+	+	+	+	+	+	+	+	+	0	10
		3	+	+	+	+	+	+	+	+	+	+	0	10
		4	6	6	6	6	7	4	6	3	6	+	50	10
		5	8	+	+	4	6	+	+	3	5	+	26	10
		6	+	+	+	12	+	14	13	+	+	+	39	10
		7	25	13	15	20	21	25	20	14	20	+	173	10
		8				62 MW 3/23								
		TOTAL	39	19	21	40	34	43	39	20	31	0	280	10

80

66.7

70

70

STANDARD REFERENCE TOXICANT ANALYSIS

Exposure: 7 day Chronic

Species: Ceriodaphnia dubia

Toxicant: Copper - ug/L

Endpoint: Survival

DATE	C-NOEC	Mean	Std Dev	CV	CT	-1 Conc	+1 Conc	Notes
9/5/2018	1	30	25.50	7.05	27.66	30	15	60
10/2/2018	2	30	25.50	7.05	27.66	30	15	60
11/27/2018	3	30	25.50	7.05	27.66	30	15	60
12/4/2018	4	30	25.50	7.05	27.66	30	15	60
12/12/2018	5	30	25.50	7.05	27.66	30	15	60
1/15/2019	6	30	25.50	7.05	27.66	30	15	60
2/19/2019	7	30	25.50	7.05	27.66	30	15	60
3/19/2019	8	30	25.50	7.05	27.66	30	15	60
4/23/2019	9	15	25.50	7.05	27.66	30	15	60
4/30/2019	10	30	25.50	7.05	27.66	30	15	60
6/4/2019	11	30	25.50	7.05	27.66	30	15	60
7/30/2019	12	30	25.50	7.05	27.66	30	15	60
8/27/2019	13	30	25.50	7.05	27.66	30	15	60
9/24/2019	14	15	25.50	7.05	27.66	30	15	60
10/1/2019	15	15	25.50	7.05	27.66	30	15	60
10/29/2019	16	15	25.50	7.05	27.66	30	15	60
12/3/2019	17	15	25.50	7.05	27.66	30	15	60
12/10/2019	18	15	25.50	7.05	27.66	30	15	60
1/21/2020	19	30	25.50	7.05	27.66	30	15	60
2/27/2020	20	30	25.50	7.05	27.66	30	15	60 00CdEAH022720

Acceptable	+ / - 1 mean
Range:	concentration
	7.5
	15
	30
	60
	120

STANDARD REFERENCE TOXICANT ANALYSIS

Exposure: 7 day Chronic

Species: Ceriodaphnia dubia

Toxicant: Copper - ug/L

Endpoint: Reproduction

DATE	C-NOEC	Mean	Std Dev	CV	CT	-1 Conc	+1 Conc	Notes
9/5/2018	1	30	21.00	8.64	41.13	30	15	60
10/2/2018	2	30	21.00	8.64	41.13	30	15	60 Lab Fails TAC
11/27/2018	3	30	21.00	8.64	41.13	30	15	60 MSDp fails. Based on IC-25 = 33.5
12/4/2018	4	30	21.00	8.64	41.13	30	15	60
12/12/2018	5	30	21.00	8.64	41.13	30	15	60
1/15/2019	6	30	21.00	8.64	41.13	30	15	60
2/19/2019	7	30	21.00	8.64	41.13	30	15	60
3/19/2019	8	15	21.00	8.64	41.13	30	15	60
4/23/2019	9	7.5	21.00	8.64	41.13	30	15	60
4/30/2019	10	15	21.00	8.64	41.13	30	15	60
6/4/2019	11	30	21.00	8.64	41.13	30	15	60
7/30/2019	12	15	21.00	8.64	41.13	30	15	60
8/27/2019	13	30	21.00	8.64	41.13	30	15	60
9/24/2019	14	15	21.00	8.64	41.13	30	15	60
10/1/2019	15	15	21.00	8.64	41.13	30	15	60
10/29/2019	16	15	21.00	8.64	41.13	15	7.5	30
12/3/2019	17	15	21.00	8.64	41.13	15	7.5	30
12/10/2019	18	15	21.00	8.64	41.13	15	7.5	30 Significant at lowest concentration, value based on IC-
1/21/2020	19	7.5	21.00	8.64	41.13	15	7.5	30
2/27/2020	20	15	21.00	8.64	41.13	15	7.5	30 00CdEAH022720

Acceptable	+ / - 1 mean
Range:	concentration
	7.5
	15
	30
	60
	120

STANDARD REFERENCE TOXICANT ANALYSIS

Exposure: 7 day Chronic

Species: *Ceriodaphnia dubia*

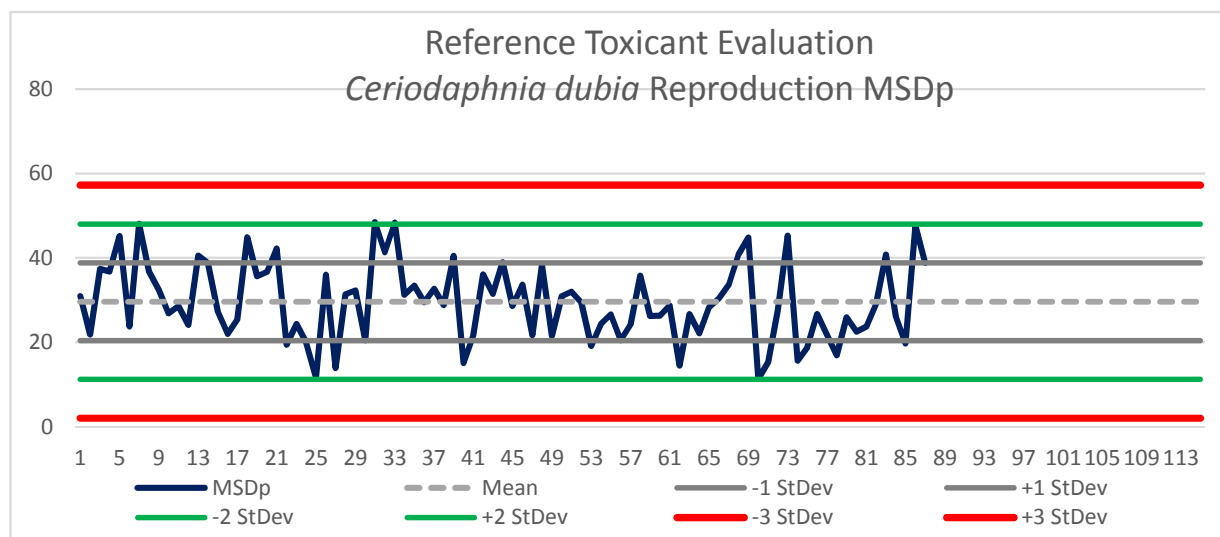
Toxicant: Copper - ug/L

Temperature: 25C

Long Term Mean: 29.60345

Long Term CV: 31%

Date		MSDp	Mean	Std	2 Std	CV	Mean	Mean	Mean	Mean	Mean	Mean
				Dev	Dev		-1 Std	+1 Std	-2 Std	+2 Std	-3 Std	+3 Std
9/5/2018		40.8	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22
10/2/2018		44.8	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22
11/27/2018	70	11.3	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22
12/4/2018		15.3	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22
12/12/2018		27.6	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22
1/15/2019		45.3	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22
2/19/2019		15.6	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22
3/19/2019	75	18.7	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22
4/23/2019		26.7	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22
4/30/2019		21.7	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22
6/4/2019		16.9	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22
7/30/2019		25.9	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22
8/27/2019	80	22.5	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22
9/24/2019		23.7	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22
10/1/2019		29	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22
10/29/2019		40.8	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22
12/3/2019		26.1	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22
12/10/2019	85	19.7	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22
1/21/2020		47.6	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22
2/27/2020		38.8	29.60	9.20	18.41	31.09	20.40	38.81	11.19	48.01	1.99	57.22



Issued by:

Reviewed by:

CETIS Test Data Worksheet

Report Date: 23 Mar-20 13:08 (p 1 of 3)
Test Code/ID: 33893Cd / 03-9678-8004

Ceriodaphnia 7-d Survival and Reproduction Test

Enthalpy Analytical, LLC

Start Date: 12 Mar-20 15:00 Species: Ceriodaphnia dubia Sample Code: 33893Cd
End Date: 19 Mar-20 15:25 Protocol: EPA/821/R-02-013 (2002) Sample Source: Ayer WWTF
Sample Date: 11 Mar-20 06:50 Material: WWTP, Municipal Treatment Plant Sample Station: MA0100013; Final Discharge

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male	Notes
0	MS	1	71	1							1	46	0	
0	MS	2	40	1							1	27	0	
0	MS	3	65	1							1	25	0	
0	MS	4	60	1							1	32	0	
0	MS	5	1	1							1	37	0	
0	MS	6	8	1							1	39	0	
0	MS	7	21	1							1	32	0	
0	MS	8	28	1							1	27	0	
0	MS	9	9	1							1	40	0	
0	MS	10	79	1							1	0	0	
0	RW	1	42	1							1	45	0	
0	RW	2	74	1							1	30	0	
0	RW	3	34	1							1	25	0	
0	RW	4	67	1							1	33	0	
0	RW	5	14	1							1	33	0	
0	RW	6	10	1							1	42	0	
0	RW	7	38	1							1	39	0	
0	RW	8	25	1							1	28	0	
0	RW	9	41	1							1	44	0	
0	RW	10	61	1							1	0	0	
6.25		1	29	1							1	47	0	
6.25		2	3	1							1	26	0	
6.25		3	26	1							1	28	0	
6.25		4	27	1							1	0	0	
6.25		5	24	1							1	27	0	
6.25		6	43	1							1	40	0	
6.25		7	69	1							1	43	0	
6.25		8	35	1							1	34	0	
6.25		9	58	1							1	38	0	
6.25		10	20	1							1	0	0	
7.7		1	32	1							1	42	0	
7.7		2	70	1							1	27	0	
7.7		3	7	1							1	22	0	
7.7		4	80	1							1	36	0	

CETIS Test Data Worksheet

Report Date:

23 Mar-20 13:08 (p 2 of 3)

Test Code/ID:

33893Cd / 03-9678-8004

Conc.-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male	Notes
7.7		5	13	1							1	33	0	
7.7		6	56	1							1	36	0	
7.7		7	12	1							1	38	0	
7.7		8	66	1							1	38	0	
7.7		9	16	1							1	44	0	
7.7		10	2	1							1	21	0	
12.5		1	49	1							1	49	0	
12.5		2	78	1							1	22	0	
12.5		3	44	1							1	32	0	
12.5		4	4	1							1	33	0	
12.5		5	23	1							1	39	0	
12.5		6	51	1							1	40	0	
12.5		7	37	1							1	42	0	
12.5		8	19	1							1	31	0	
12.5		9	68	1							1	44	0	
12.5		10	52	1							1	29	0	
25		1	31	1							1	52	0	
25		2	54	1							1	22	0	
25		3	17	1							1	29	0	
25		4	11	1							1	42	0	
25		5	15	1							1	26	0	
25		6	76	1							1	43	0	
25		7	75	1							1	41	0	
25		8	57	1							1	29	0	
25		9	77	1							0	6	0	
25		10	45	1							1	0	0	
50		1	59	1							1	42	0	
50		2	53	1							1	21	0	
50		3	72	1							1	31	0	
50		4	63	1							1	36	0	
50		5	22	1							1	29	0	
50		6	33	1							1	49	0	
50		7	48	1							1	42	0	
50		8	30	1							1	28	0	
50		9	55	1							1	51	0	
50		10	62	1							1	30	0	
100		1	73	1							1	39	0	
100		2	6	1							1	19	0	

CETIS Test Data Worksheet

Report Date: 23 Mar-20 13:08 (p 3 of 3)
 Test Code/ID: 33893Cd / 03-9678-8004

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male	Notes
100		3	36	1							1	21	0	
100		4	50	1							1	42	0	
100		5	39	1							1	34	0	
100		6	18	1							1	43	0	
100		7	5	1							1	39	0	
100		8	47	1							1	20	0	
100		9	46	1							1	31	0	
100		10	64	1							1	0	0	

CETIS Summary Report

Report Date: 23 Mar-20 13:42 (p 1 of 1)
Test Code/ID: 33893Cd / 03-9678-8004

Ceriodaphnia 7-d Survival and Reproduction Test										Enthalpy Analytical, LLC			
Batch ID: 08-4049-7647			Test Type: Reproduction-Survival (7d)					Analyst: Meredith Wheeler					
Start Date: 12 Mar-20 15:00			Protocol: EPA/821/R-02-013 (2002)					Diluent: Receiving Water					
Ending Date: 19 Mar-20 15:25			Species: Ceriodaphnia dubia					Brine: Not Applicable					
Test Length: 7d 0h			Taxon: Branchiopoda					Source: In-House Culture Age: <24					
Sample ID: 01-9044-6436			Code: 33893Cd					Project: First Quarter WET Compliance Test					
Sample Date: 11 Mar-20 06:50			Material: WWTP, Municipal Treatment Plant					Source: Ayer WWTF					
Receipt Date: 11 Mar-20 14:25			CAS (PC):					Station: MA0100013; Final Discharge					
Sample Age: 32h (0 °C)			Client: Town of Ayer, DPW										
Multiple Comparison Summary													
Analysis ID	Endpoint	Comparison Method					✓	NOEL	LOEL	TOEL	TU	PMSD	S
07-1794-1071	7d Proportion Survived	Fisher Exact/Bonferroni-Holm Test						100	>100	n/a	1	n/a	1
12-6027-6371	Reproduction	Steel Many-One Rank Sum Test						100	>100	n/a	1	41.7%	1
7d Proportion Survived Summary													
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect		
0	MS	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%		
0	RW	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%		
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%		
7.7		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%		
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%		
25		10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%		
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%		
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%		
Reproduction Summary													
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect		
0	MS	10	30.5	21.5	39.5	0	46	3.99	12.6	41.39%	0.00%		
0	RW	10	31.9	22.5	41.3	0	45	4.16	13.2	41.23%	-4.59%		
6.25		10	28.3	16.5	40.1	0	47	5.2	16.5	58.16%	7.21%		
7.7		10	33.7	28	39.4	21	44	2.51	7.93	23.53%	-10.49%		
12.5		10	36.1	30.3	41.9	22	49	2.56	8.09	22.41%	-18.36%		
25		10	29	17.2	40.8	0	52	5.23	16.6	57.08%	4.92%		
50		10	35.9	28.9	42.9	21	51	3.1	9.8	27.31%	-17.70%		
100		10	28.8	19	38.6	0	43	4.32	13.7	47.43%	5.57%		
7d Proportion Survived Detail													
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10		
0	MS	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
0	RW	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
7.7		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	1.000		
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
Reproduction Detail													
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10		
0	MS	46	27	25	32	37	39	32	27	40	0		
0	RW	45	30	25	33	33	42	39	28	44	0		
6.25		47	26	28	0	27	40	43	34	38	0		
7.7		42	27	22	36	33	36	38	38	44	21		
12.5		49	22	32	33	39	40	42	31	44	29		
25		52	22	29	42	26	43	41	29	6	0		
50		42	21	31	36	29	49	42	28	51	30		
100		39	19	21	42	34	43	39	20	31	0		

CETIS Analytical Report

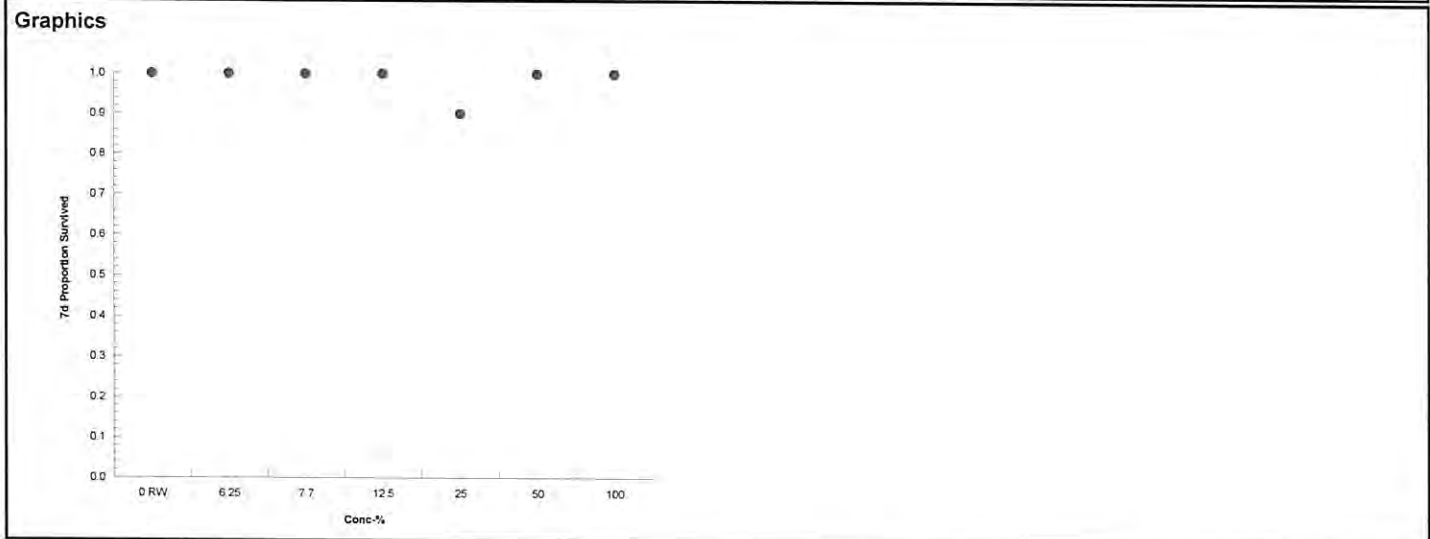
Report Date: 23 Mar-20 13:41 (p 1 of 1)
Test Code/ID: 33893Cd / 03-9678-8004

Ceriodaphnia 7-d Survival and Reproduction Test				Enthalpy Analytical, LLC	
Analysis ID: 07-1794-1071		Endpoint: 7d Proportion Survived		CETIS Version: CETISv1.9.6	
Analyzed: 23 Mar-20 13:41		Analysis: STP 2xK Contingency Tables		Status Level: 1	
Sample ID: 01-9044-6436		Code: 33893Cd		Project: First Quarter WET Compliance Test	
Sample Date: 11 Mar-20 06:50		Material: WWTP, Municipal Treatment Plant		Source: Ayer WWTF	
Receipt Date: 11 Mar-20 14:25		CAS (PC):		Station: MA0100013; Final Discharge	
Sample Age: 32h (0 °C)		Client: Town of Ayer, DPW			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	>100	n/a	1

Fisher Exact/Bonferroni-Holm Test						
Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Receiving Water		6.25	1.000	Exact	1.0000	Non-Significant Effect
		7.7	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	0.500	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary							
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	RW	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
7.7		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		9	1	10	0.9	0.1	10.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%



CETIS Analytical Report

Report Date: 23 Mar-20 13:41 (p 1 of 1)
Test Code/ID: 33893Cd / 03-9678-8004

Ceriodaphnia 7-d Survival and Reproduction Test

Enthalpy Analytical, LLC

Analysis ID: 12-6027-6371	Endpoint: Reproduction	CETIS Version: CETISv1.9.6
Analyzed: 23 Mar-20 13:41	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Sample ID: 01-9044-6436	Code: 33893Cd	Project: First Quarter WET Compliance Test
Sample Date: 11 Mar-20 06:50	Material: WWTP, Municipal Treatment Plant	Source: Ayer WWTF
Receipt Date: 11 Mar-20 14:25	CAS (PC):	Station: MA0100013; Final Discharge
Sample Age: 32h (0 °C)	Client: Town of Ayer, DPW	

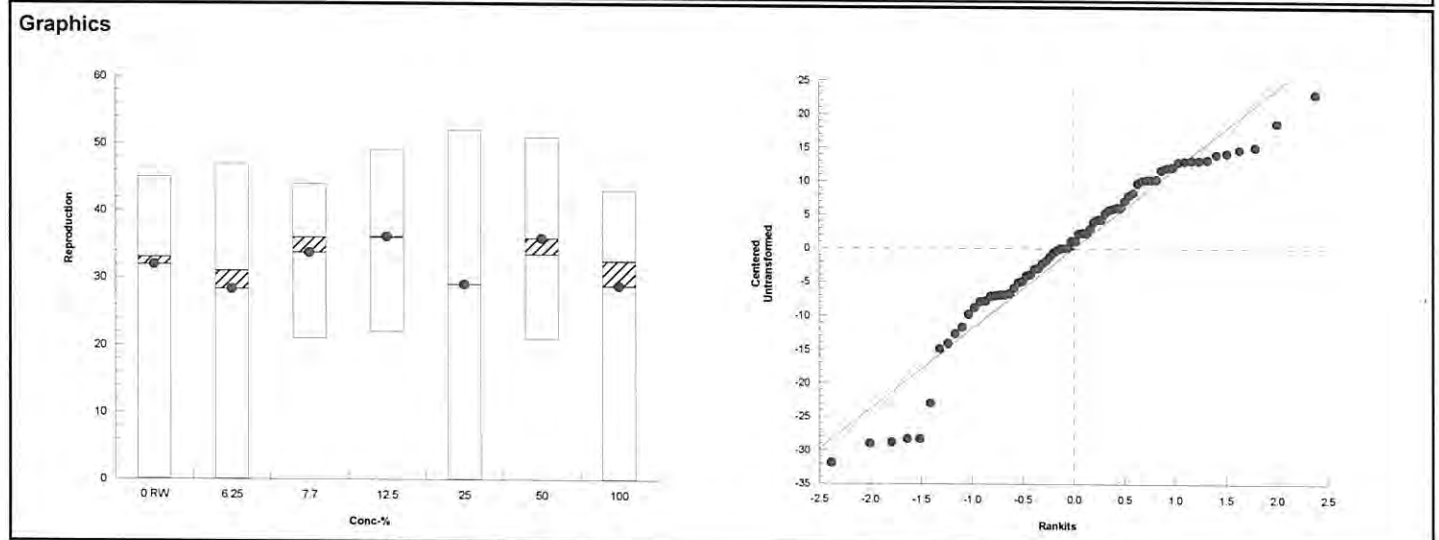
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	>100	n/a	1	41.70%

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Receiving Water		6.25	99.5	74	2	18	CDF	0.7143	Non-Significant Effect
		7.7	104	74	3	18	CDF	0.8355	Non-Significant Effect
		12.5	112	74	4	18	CDF	0.9520	Non-Significant Effect
		25	98	74	2	18	CDF	0.6663	Non-Significant Effect
		50	110	74	3	18	CDF	0.9366	Non-Significant Effect
		100	97	74	3	18	CDF	0.6328	Non-Significant Effect

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	678.371	113.062	6	0.701	0.6498	Non-Significant Effect
Error	10160.5	161.278	63			
Total	10838.9		69			

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	9.47	16.8	0.1488	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.94	0.953	0.0023	Non-Normal Distribution

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	RW	10	31.9	22.5	41.3	33	0	45	4.16	41.23%	0.00%
6.25		10	28.3	16.5	40.1	31	0	47	5.2	58.16%	11.29%
7.7		10	33.7	28	39.4	36	21	44	2.51	23.53%	-5.64%
12.5		10	36.1	30.3	41.9	36	22	49	2.56	22.41%	-13.17%
25		10	29	17.2	40.8	29	0	52	5.23	57.08%	9.09%
50		10	35.9	28.9	42.9	33.5	21	51	3.1	27.31%	-12.54%
100		10	28.8	19	38.6	32.5	0	43	4.32	47.43%	9.72%



Ceriodaphnia dubia - Blocking By Parentage Tracking Sheet

ESI #: 33893

CLIENT: Ayer

START DATE: 03/12/20

START TIME: 1500

INITIAL: HED

COLUMN added to	C. dubia ADULT USED	
	board #	cup #
A	MSR 1106	1A
B	MHR 942	1A
C		1C
D		1E
E		1F
F		1G
G		1I
H	MHR 943	1A
I		1C
J		1E

FRESHWATER CHRONIC ASSAY - NEW WATER QUALITIES
C. dubia

STUDY: 33893		CLIENT: Ayer, MA WWTF								SAMPLE: EFFLUENT		DILUENT: Receiving Water (RW)							
NEW DISSOLVED OXYGEN (mg/L)										pH (SU)									
CONC	REP	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7		
MSR	A	8.7	8.6	8.6	8.6	8.8	8.6	8.6		7.64	7.57	7.77	7.76	7.74	7.84	7.69			
RW	A	9.6	9.4	10.3	9.5	9.3	10.1	9.4		6.92	7.06	7.07	6.93	6.99	7.01	7.01			
6.25%	A	9.6	8.7	10.3	9.4	9.3	10.1	9.3		7.05	7.21	7.12	7.09	7.14	7.08	7.19			
7.7%	A	9.5	8.8	10.3	9.4	9.3	10.0	9.2		7.08	7.25	7.18	7.12	7.17	7.12	7.23			
12.5%	A	9.6	8.7	10.2	9.4	9.3	9.8	9.2		7.17	7.32	7.27	7.21	7.27	7.24	7.30			
25%	A	9.5	8.7	10.1	9.3	9.2	9.7	9.1		7.34	7.58	7.43	7.35	7.43	7.44	7.48			
50%	A	9.6	8.6	10.0	9.3	9.2	9.7	9.0		7.58	7.80	7.60	7.51	7.56	7.61	7.66			
100%	A	9.5	8.5	9.9	9.2	9.1	10.1	9.1		7.74	7.85	7.73	7.63	7.67	7.70	7.73			
NEW SPECIFIC CONDUCTIVITY (µmhos/cm)										NEW TEMPERATURE (°C)									
CONC	REP	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7		
MSR	A	214	216	222	218	218	220	214		22	22	22	23	23	23	23			
RW	A	340	347	373	385	384	325	325		22	23	22	24	24	23	23			
6.25%	A	406	412	440	456	445	388	341		22	23	22	24	24	23	23			
7.7%	A	412	432	452	463	451	397	345		22	23	22	24	23	23	23			
12.5%	A	457	473	490	506	500	447	443		22	23	22	24	23	23	23			
25%	A	572	589	600	618	606	564	561		22	23	22	24	23	24	23			
50%	A	815	827	825	844	836	799	800		22	23	22	24	23	23	23			
100%	A	1258	1287	1258	1301	1251	1248	1245		22	23	22	24	22	23	23			
Inc. Temp. °C		25	25	24	25	25	25	25											
DATE:		03/12/20	03/13/20	03/14/20	03/15	03/16	03/17	03/18											
TIME:		1030	1715	1130	1145	0950	0945	1105											
INITIALS:		HED	CA	CA	HEI	HEI	CA	CA											

RW = Receiving Water

DAY 0 (START)								DAY 2 (1 ST RENEWAL)				DAY 5 (2 ND RENEWAL)			
	METALS	TOC	ALK	HARD	AMM	TS/TDS	TRC	ALK	HARD	AMM	TRC	ALK	HARD	AMM	TRC
EFF	-002	-003	-004	-005	-006	-007	<0.02	-017	-018	-019	<0.02	-027	-028	-029	<0.02
RW	-009	-010	-011	-012	-013			-021	-022	-023		-031	-032	-033	

Did 1st Renewal sample cause ≥50% mortality? Yes _____ No ☒
If "YES" put into circulation TOC and METALS bottles. _____

Did 2nd Renewal sample cause ≥50% mortality? Yes _____ No ☒
If "YES" put into circulation TOC and METALS bottles. _____

***Ceriodaphnia dubia* CHRONIC REPRODUCTION ASSAY**
OLD WATER QUALITIES

STUDY: 33893		CLIENT: Ayer, MA WWTF				SAMPLE: Effluent						
CONC	DAY	pH (SU)	Temp (°C)	DO (mg/L)	S/C (µMHOS/CM)	CONC	DAY	pH (SU)	Temp (°C)	DO (mg/L)	S/C (µMHOS/CM)	INIT
MSR	1	7.99	23	8.7	243	12.5%	1	7.87	23	8.5	497	CFS
	2	7.84	21	8.6	239		2	8.03	21	8.8	528	CA
	3	8.01	22	8.8	248		3	7.96	22	8.6	532	GRS
	4	8.03	22	9.0	240		4	7.94	22	8.8	528	HED
	5	7.79	21	8.7	243		5	7.81	21	8.5	519	HED
	6	7.88	22	8.8	301		6	7.89	21	8.9	587	PES
	7	7.81	23	8.6	242		7	7.82	22	8.5	486	HED
	8						8					
RW	1	7.70	23	8.5	380	25%	1	7.99	22	8.5	617	
	2	7.73	21	8.4	389		2	8.23	21	8.9	659	
	3	7.80	22	8.7	413		3	8.17	22	8.6	657	
	4	7.78	22	8.9	411		4	8.11	22	8.8	642	
	5	7.61	21	8.6	406		5	8.01	21	8.5	631	
	6	7.57	22	8.7	456		6	8.09	21	8.9	710	
	7	7.53	23	8.4	366		7	8.02	22	8.4	604	
	8						8					
6.25%	1	7.77	23	8.5	445	50%	1	8.29	22	8.5	869	
	2	7.88	21	8.8	456		2	8.45	21	8.9	910	
	3	7.85	22	8.7	476		3	8.43	22	8.6	907	
	4	7.87	22	8.8	483		4	8.36	22	8.8	871	
	5	7.68	21	8.5	468		5	8.27	21	8.5	864	
	6	7.75	22	8.7	549		6	8.36	21	9.0	962	
	7	7.65	23	8.4	430		7	8.27	22	8.4	853	
	8						8					
7.7%	1	7.81	23	8.5	450	100%	1	8.64	22	8.5	1333	
	2	7.87	21	8.8	466		2	8.65	21	8.9	1384	
	3	7.91	22	8.6	491		3	8.65	22	8.6	1378	
	4	7.88	22	8.8	486		4	8.60	22	8.8	1344	
	5	7.71	21	8.6	474		5	8.54	21	8.5	1304	
	6	7.78	22	8.7	549		6	8.60	21	9.1	1443	
	7	7.71	22	8.4	433		7	8.50	21	8.4	1293	
	8						8					

RW = RECEIVING WATER

PREPARATION OF DILUTIONS

STUDY: 33893		CLIENT: Ayer	
SPECIES: <i>C. dubia</i>			
Diluent: Receiving Water		$E_o = 23.5^{\circ}\text{C}$ $D_o = 23.8^{\circ}\text{C}$ Sample: E_o, D_o	
Concentration %	Vol. Eff. (mL)	Final Vol. (mL)	
Lab Control	0	100	
Receiving Water	0	100	
6.25%	6.25	100	
12.5%	12.5	100	
25%	25	100	
50%	50	100	
100%	100	100	
INITIALS:	CFS		
TIME:	0910		
DATE:	03/12/20		

PREPARATION OF DILUTIONS

STUDY: 33893			CLIENT: Ayer, MA WWTF							
SPECIES: <i>C. dubia</i>			TEST: chronic renewal							
START	Day: 0 $E_0 = 24.3^\circ\text{C}$ $D_0 = 24.0^\circ\text{C}$		Day: 1 $E_0 = 24.3^\circ\text{C}$ $D_0 = 24.6^\circ\text{C}$		Day:					
	Sample: E_0, D_0		Sample: E_0, D_0		Sample:					
Diluent: RW										
Concentration	Vol. Eff.	Final Vol.	Vol. Eff.	Final Vol.	Vol. Eff.	Final Vol.	Day	Date	Time	Init
MSR	0	200	0	200			0	03/12/20	0940	CFS
RW	0		0				1	03/13/20	1330	RA
6.25%	12.5		12.5				2	03/14	0945	CFS
7.7%	15.4		15.4				3	03/15/20	1110	GRS
12.5%	25		25				4	03/16/20	0940	HEP
25%	50		50				5	03/17	0920	CFS
50%	100		100				6	03/18	0900	CFS
100%	200	↓	200	↓			7			
1st Renewal	Day: 2 $E_1 = 23.5^\circ\text{C}$ $D_1 = 23.5^\circ\text{C}$		Day: 3 $E_1 = 25.4^\circ\text{C}$ $D_1 = 25.4^\circ\text{C}$		Day: 4 $E_1 = 24.7^\circ\text{C}$ $D_1 = 25.6^\circ\text{C}$		RW = Receiving Water MSR ID: Day 0: 33899, W-1273 Day 1: 33899, W-1273 Day 2: 33899, W-1273 Day 3: 33899, W-1273 Day 4: 33899, W-1273 Day 5: 33899, W-1273 Day 6: 33899, W-1273 Day 7: _____			
Diluent: RW	Sample: E_1, D_1		Sample: E_1, D_1		Sample: E_1, D_1					
Concentration	Vol. Eff.	Final Vol.	Vol. Eff.	Final Vol.	Vol. Eff.	Final Vol.				
MSR	0	200	0	200	0	200				
RW	0		0		0					
6.25%	12.5		12.5		12.5					
7.7%	15.4		15.4		15.4					
12.5%	25		25		25					
25%	50		50		50					
50%	100		100		100					
100%	200	↓	200	↓	200	↓				
2nd Renewal	Day: 5 $E_2 = 24.4^\circ\text{C}$ $D_2 = 24.6^\circ\text{C}$		Day: 6 $E_2 = 24.1^\circ\text{C}$ $D_2 = 24.9^\circ\text{C}$		Day:		Day:			
Diluent: RW	Sample: E_2, D_2		Sample: E_2, D_2		Sample:		Sample			
Concentration	Vol. Eff.	Final Vol.	Vol. Eff.	Final Vol.	Vol. Eff.	Final Vol.	Vol. Eff.	Final Vol.		
MSR	0	200	0	200						
RW	0		0							
6.25%	12.5		12.5							
7.7%	15.4		15.4							
12.5%	25		25							
25%	50		50							
50%	100		100							
100%	200	↓	200	↓						

RECORD OF METERS USED

STUDY: 33893		CLIENT: Ayer	
C. dubia			
Exposure (Hours)			
	0	24	48
Water Quality Station #	2	1	1
Initials / Date	CA 03/12	CA 03/13	CA 03/14

Water Quality Station #1		Water Quality Station #2		COMMENTS
DO meter #		DO meter #		
DO probe #		DO probe #		
pH meter #		pH meter #		
pH probe #		pH probe #		
S/C meter #		S/C meter #		
S/C probe #		S/C probe #		

RECORD OF METERS USED FOR WATER QUALITY MEASUREMENT

C. dubia

STUDY: 33893				CLIENT: Ayer, MA WWTF						
OLD WATER QUALITIES										
	0	1	2	3	4	5	6	7	8	
Water Quality Station #	/	2	1	1	1	2	2	1	/	
Temperature: Thermometer or Probe #	/	1	159	159	159	1	1	159	/	
Initials	/	CFS	CA	GRS	HED	HED	PBS	HED	/	
NEW WATER QUALITIES										
	0	1	2	3	4	5	6	7	8	
Water Quality Station #	2	2	2	2	1	1	2	/	/	
Temperature: Thermometer or Probe #	1	1	1	1	159	159	1	/	/	
Initials	HED	CA	CA	HED	HED	CA	CA	/	/	
Date	03/12/20	03/13	03/14/20	3/15/20	3/16/20	03/17/20	03/18/20	03/19/20	/	

Water Quality Station #1		Water Quality Station #2		COMMENTS
DO meter #		DO meter #		
DO probe #		DO probe #		
pH meter #		pH meter #		
pH probe #		pH probe #		
S/C meter #		S/C meter #		
S/C probe #		S/C probe #		

Report No: 33893
Project: Ayer

SDG:

Sample ID: Effluent Start
Matrix: Water
Sampled: 03/11/20 0650

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Total solids	33893-007	750	10	mg/L	03/13/20 0905	03/19/20 1015	CA /SM 2540B
Total dissolved solids	33893-007	740	5	mg/L	03/13/20 1015	03/19/20 1425	CA /SM 2540C
Alkalinity as CaCO3	33893-004	210	5	mg/L	03/17/20 1212	03/17/20 1212	AS /EPA 310.2
Total organic carbon	33893-003	10.5	0.4	mg/L	03/12/20 1045	03/12/20 1100	AS /SM 5310 B
Ammonia-N	33893-006	1.03	0.1	mg/L as N	03/13/20 1155	03/13/20 1155	AS /SM 4500-NH3 G
Hardness as CaCO3	33893-005	180	0.7	mg/L	03/18/20 0900	03/18/20 1547	AS /ess/SW846 3rd Ed. 6020
Aluminum, total	33893-002	ND	0.02	mg/L	03/17/20 1000	03/17/20 2002	JLH/EPA 200.8
Cadmium, total	33893-002	ND	0.0003	mg/L	03/17/20 1000	03/17/20 2002	JLH/EPA 200.8
Calcium, total	33893-002	58.8	0.1	mg/L	03/17/20 1000	03/17/20 2002	JLH/EPA 200.8
Copper, total	33893-002	0.0068	0.0005	mg/L	03/17/20 1000	03/17/20 2002	JLH/EPA 200.8
Lead, total	33893-002	ND	0.0003	mg/L	03/17/20 1000	03/17/20 2002	JLH/EPA 200.8
Magnesium, total	33893-002	9.39	0.1	mg/L	03/17/20 1000	03/17/20 2002	JLH/EPA 200.8
Nickel, total	33893-002	0.0042	0.002	mg/L	03/17/20 1000	03/17/20 2002	JLH/EPA 200.8
Zinc, total	33893-002	0.032	0.005	mg/L	03/17/20 1000	03/17/20 2002	JLH/EPA 200.8

Sample ID: Effluent First Renewal
Matrix: Water
Sampled: 03/13/20 0630

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO3	33893-017	230	5	mg/L	03/17/20 1214	03/17/20 1214	AS /EPA 310.2
Ammonia-N	33893-019	2.22	0.1	mg/L as N	03/16/20 0914	03/16/20 0914	AS /SM 4500-NH3 G
Hardness as CaCO3	33893-018	190	0.7	mg/L	03/18/20 0900	03/18/20 1638	AS /ess/SW846 3rd Ed. 6020

Sample ID: Effluent Second Renewal
Matrix: Water
Sampled: 03/16/20 0630

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO3	33893-027	240	5	mg/L	03/17/20 1215	03/17/20 1215	AS /EPA 310.2
Ammonia-N	33893-029	7.08	0.1	mg/L as N	03/17/20 1004	03/17/20 1004	AS /SM 4500-NH3 G
Hardness as CaCO3	33893-028	170	0.7	mg/L	03/18/20 0900	03/18/20 1657	AS /ess/SW846 3rd Ed. 6020

Notes:

ND = Not Detected

Report No: 33893
Project: Ayer

SDG:

Sample ID: Receiving Water Start
Matrix: Water
Sampled: 03/11/20 0845

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO3	33893-011	22	2	mg/L	03/17/20 1243	03/17/20 1243	AS /EPA 310.2
Total organic carbon	33893-010	3.2	0.4	mg/L	03/12/20 1045	03/12/20 1100	AS /SM 5310 B
Ammonia-N	33893-013	ND	0.1	mg/L as N	03/13/20 1154	03/13/20 1154	AS /SM 4500-NH3 G
Hardness as CaCO3	33893-012	43	0.7	mg/L	03/18/20 0900	03/18/20 1550	AS /ess/SW846 3rd Ed. 6020
Aluminum, total	33893-009	0.063	0.02	mg/L	03/17/20 1000	03/17/20 2021	JLH/EPA 200.8
Cadmium, total	33893-009	ND	0.0003	mg/L	03/17/20 1000	03/17/20 2021	JLH/EPA 200.8
Calcium, total	33893-009	12.9	0.1	mg/L	03/17/20 1000	03/17/20 2021	JLH/EPA 200.8
Copper, total	33893-009	0.0022	0.0005	mg/L	03/17/20 1000	03/17/20 2021	JLH/EPA 200.8
Lead, total	33893-009	0.0009	0.0003	mg/L	03/17/20 1000	03/17/20 2021	JLH/EPA 200.8
Magnesium, total	33893-009	2.45	0.1	mg/L	03/17/20 1000	03/17/20 2021	JLH/EPA 200.8
Nickel, total	33893-009	ND	0.002	mg/L	03/17/20 1000	03/17/20 2021	JLH/EPA 200.8
Zinc, total	33893-009	0.012	0.005	mg/L	03/17/20 1000	03/17/20 2021	JLH/EPA 200.8

Sample ID: Receiving Water First Renewal
Matrix: Water
Sampled: 03/13/20 0745

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO3	33893-021	24	2	mg/L	03/17/20 1244	03/17/20 1244	AS /EPA 310.2
Ammonia-N	33893-023	ND	0.1	mg/L as N	03/16/20 0915	03/16/20 0915	AS /SM 4500-NH3 G
Hardness as CaCO3	33893-022	49	0.7	mg/L	03/18/20 0900	03/18/20 1645	AS /ess/SW846 3rd Ed. 6020

Sample ID: Receiving Water Second Renewal
Matrix: Water
Sampled: 03/16/20 0815

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO3	33893-031	18	2	mg/L	03/17/20 1245	03/17/20 1245	AS /EPA 310.2
Ammonia-N	33893-033	ND	0.1	mg/L as N	03/17/20 1005	03/17/20 1005	AS /SM 4500-NH3 G
Hardness as CaCO3	33893-032	39	0.7	mg/L	03/18/20 0900	03/18/20 1700	AS /ess/SW846 3rd Ed. 6020

Notes:

ND = Not Detected

SAMPLE RECEIPT RECORD FOR CHRONIC TOXICITY EVALUATIONS

STUDY #: 33893		CLIENT: AYER	
SAMPLE RECEIPT INFORMATION			
	Start Sample	SECOND RENEWAL First Renewal	FIRST RENEWAL Second Renewal
Receipt Date & Time:	03/11/20 1425	03/14/20 0915	3/13/20 0900
Received By:	LAG	RS	MG
Temperature at Receipt:	0.2°C	1.9°C	3/13/20 0.3°C
Delivered Via:	<input type="checkbox"/> Enthalpy <input checked="" type="checkbox"/> Client <input type="checkbox"/> Courier <input type="checkbox"/> FedEx <input type="checkbox"/> UPS	<input checked="" type="checkbox"/> Enthalpy <input type="checkbox"/> Client <input type="checkbox"/> Courier <input type="checkbox"/> FedEx <input type="checkbox"/> UPS	<input checked="" type="checkbox"/> Enthalpy <input type="checkbox"/> Client <input type="checkbox"/> Courier <input type="checkbox"/> FedEx <input type="checkbox"/> UPS
Logged In Date & Time:	03/11/20 1710	03/14/20 1605	3/13/20 1615
Logged at Lab By:	BS	W	MW
Temperature at Log In:	3.6°C	5.6°C	5.3°C
SAMPLE CONDITION INFORMATION			
Chain of Custody?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Chain of Custody Signed?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Chain of Custody Complete?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Sample Date?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Sample Time?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Sample Type?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Custody Seal in Place?	Yes <input checked="" type="radio"/> NA No	Yes <input checked="" type="radio"/> NA No	Yes <input checked="" type="radio"/> NA No
Shipping Container Intact?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Client notified of temp?	Yes or <input checked="" type="radio"/> No	Yes or <input checked="" type="radio"/> No	Yes or <input checked="" type="radio"/> No
Sample Arrived on Ice?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
COMMENTS:	See COC	See COC	See COC

Q:\Forms\Lab Forms\Sampling & Receipt\Sample Receipt Record - Chronic -R1 2019-07-09.docx

**Renee
McIsaac**

Digitally signed by Renee McIsaac
DN: cn=Renee McIsaac, o=Ecology
Analytical, ou=Project Manager,
OU=Member,
email=renee.mcisaac@ecology.ca,
c=CA Date: 2019.07.09 08:24:23 -0400



Enthalpy Analytical
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345

Enthalpy Job No: 33893

CHAIN OF CUSTODY DOCUMENTATION

Client: Ayer, Ma WWTF	Contact: Paula Boyle	Project Name: Ayer, MA	Q1 2020
Report to: Paula Boyle	Address: Hoyle Tanner & Assoc Inc	Project Number: P0064	Task: 0001
Invoice to: Paula Boyle	Address: Manchester, NH 03101	Project Manager: Paula Boyle	
Voice: 603-669-5555	Fax: 603-669-4168	email: sewer@ayer.ma.us	P.O: '

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
001	Effluent Start	3-10/ 3-11	0720/ 0650	AT	C	1	3750	P	4 C	Water	N	CD7DCR, CD48AD StartSample
002	Effluent Start	3-10/ 3-11	0720/ 0650	AT	C	1	250	P	HNO3	Water	N	Total Metals Cd,Ni,Pb,Cu,Zn,Al,Ca,Mg;
003	Effluent Start	3-10/ 3-11	0720/ 0650	AT	C	1	40	G	4 C	Water	N	TOC
004	Effluent Start	3-10/ 3-11	0720/ 0650	AT	C	1	125	P	4 C	Water	N	ALK
005	Effluent Start	3-10/ 3-11	0720/ 0650	AT	C	1	125	P	HNO3	Water	N	Metals Hard;
006	Effluent Start	3-10/ 3-11	0720/ 0650	AT	C	1	125	P	H2SO4	Water	N	NH3;
007	Effluent Start	3-10/ 3-11	0720/ 0650	AT	C	1	500	P	4 C	Water	N	TS,TDS

Relinquished By: <i>Chad L.</i>	Date: 3/11/20	Time: 1425	Received By: <i>Luigi Yee</i>	Date: 03/11/20	Time: 1425	Temp (C): 0.2
Relinquished By:	Date:	Time:	Received at Lab By:	Date:	Time:	Temp (C): T-292

Comments: COMPOSITE SAMPLING TOOK PLACE IN 30 MINUTE INTERVALS OVER A 24 HOUR PERIOD, STARTING AT 0720 ON 3/10 AND ENDING AT 0650 ON 3/11 WITH 48 GRABS COLLECTED AND COMBINED TO FORM A COMPOSITE.

COC Number: A1018533	Sample Delivery Group No: March 2020	Page 1 of 2
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Hampton, NH 03842

Voice: 603-926-3345

Enthalpy Job No: 33893

CHAIN OF CUSTODY DOCUMENTATION

Client: Ayer, Ma WWTF	Contact: Paula Boyle	Project Name: Ayer, MA	Q1 2020
Report to: Paula Boyle	Address: Hoyle Tanner & Assoc Inc	Project Number: P0064	Task: 0001
Invoice to: Paula Boyle	Address: Manchester, NH 03101	Project Manager: Paula Boyle	
Voice: 603-669-5555	Fax: 603-669-4168	email: sewer@ayer.ma.us	P.O: '

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
008	Receiving Water Start	3/11/20	0845	AT	G	1	3750	P	4 C	Water	N	CD7DCR StartDiluent
009	Receiving Water Start	3/11/20	0845	AT	G	1	250	P	HNO3	Water	N	Total Metals Cd,Ni,Pb,Cu,Zn,Al,Ca,Mg;
010	Receiving Water Start	3/11/20	0845	AT	G	1	40	G	4 C	Water	N	TOC
011	Receiving Water Start	3/11/20	0845	AT	G	1	125	P	4 C	Water	N	Alk
012	Receiving Water Start	3/11/20	0845	AT	G	1	125	P	HNO3	Water	N	Metals Hard;
013	Receiving Water Start	3/11/20	0845	AT	G	1	125	P	H2SO4	Water	N	NH3;

Relinquished By:	Date: 3/11/20	Time: 1425	Received By:	Date: 03/11/20	Time: 1425	Temp (C): 0.2
Relinquished By:	Date:	Time:	Received at Lab By:	Date:	Time:	Temp (C): T-292
Comments: RECEIVING WATER WAS COLLECTED FROM THE NASHUA RIVER IN AYER, MA OFF OF MACPHERSON RD.						

COC Number: A1018533

Sample Delivery Group No:	March 2020	Page 2 of 2
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Ayer Massachusetts WWTF Effluent Evaluation, March 2020.
Study Numbers 33893.

Data Appendix Page 28



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1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345

Enthalpy Job No: 33893

CHAIN OF CUSTODY DOCUMENTATION

Client: Ayer, Ma WWTF	Contact: Paula Boyle	Project Name: Ayer, MA	Q1 2020
Report to: Paula Boyle	Address: Hoyle Tanner & Assoc Inc	Project Number: P0064	Task: 0001
Invoice to: Paula Boyle	Address: Manchester, NH 03101	Project Manager: Paula Boyle	
Voice: 603-669-5555	Fax: 603-669-4168	email: sewer@ayer.ma.us	P.O: '

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
014	Effluent First Renewal	3-12 3-13	0700 0630	TW	C	1	3750	P	4 C	Water	N	CD7DCR 1stRenewal Sample
015	Effluent First Renewal	3-12 3-13	0700 0630	TW	C	1	250	P	HNO3	Water	N	Total Metals Cd,Ni,Pb,Cu,Zn,Al,Ca,Mg;
016	Effluent First Renewal	3-12 3-13	0700 0630	TW	C	1	40	G	4 C	Water	N	TOC
017	Effluent First Renewal	3-12 3-13	0700 0630	TW	C	1	125	P	4 C	Water	N	Alk
018	Effluent First Renewal	3-12 3-13	0700 0630	TW	C	1	125	P	HNO3	Water	N	Metals Hard;
019	Effluent First Renewal	3-12 3-13	0700 0630	TW	C	1	125	P	H2SO4	Water	N	NH3;
020	Receiving Water First Renewal	3-13-20	0745	TW	G	1	3750	P	4 C	Water	N	CD7DCR 1stRenewal Diluent
021	Receiving Water First Renewal	3-13-20	0745	TW	G	1	125	P	4 C	Water	N	Alk
022	Receiving Water First Renewal	3-13-20	0745	TW	G	1	125	P	HNO3	Water	N	Metals Hard;
023	Receiving Water First Renewal	3-13-20	0745	TW	G	1	125	P	H2SO4	Water	N	NH3;

Relinquished By: <i>[Signature]</i>	Date: 3-13-20 Time: 0800	Received By: <i>[Signature]</i>	Date: 3/13/20 Time: 0800 Temp (C): 0.3
Relinquished By: <i>[Signature]</i>	Date: 3/13/20 Time: 1300	Received at Lab By: <i>[Signature]</i>	Date: 3/13/20 Time: 1300 Temp (C): 5.3°C
Comments: Effluent composite collected in 30 minute intervals from 0700 3-12-20 through 0630 3-13-20. 48 Total Effluent grab samples collected over 24 hr Effluent composite collection period.			

COC Number: A1018534

Sample Delivery Group No: March 2020

Page 1 of 1

* Receiving water collected upstream of Effluent discharge pipe from Nashua River off of McPherson Rd.



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Voice: 603-926-3345

Enthalpy Job No: 33893

CHAIN OF CUSTODY DOCUMENTATION

Client: Ayer, Ma WWTF	Contact: Paula Boyle	Project Name: Ayer, MA <i>Q1 2020</i>
Report to: Paula Boyle	Address: Hoyle Tanner & Assoc Inc	Project Number: P0064 Task: 0001
Invoice to: Paula Boyle	Address: Manchester, NH 03101	Project Manager: Paula Boyle
Voice: 603-669-5555	Fax: 603-669-4168	email: sewer@ayer.ma.us P.O: '

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
024	Effluent Second Renewal	<i>3-15 3-16</i>	<i>0700 0630</i>	<i>AT</i>	<i>C</i>	1	3750	P	4 C	Water	N	CD7DCR 2ndRenewal Sample
025	Effluent Second Renewal	<i>3-15 3-16</i>	<i>0700 0630</i>	<i>AT</i>	<i>C</i>	1	250	P	HNO3	Water	N	Total Metals Cd,Ni,Pb,Cu,Zn,Al,Ca,Mg;
026	Effluent Second Renewal	<i>3-15 3-16</i>	<i>0700 0630</i>	<i>AT</i>	<i>C</i>	1	40	G	4 C	Water	N	TOC
027	Effluent Second Renewal	<i>3-15 3-16</i>	<i>0700 0630</i>	<i>AT</i>	<i>C</i>	1	125	P	4 C	Water	N	Alk
028	Effluent Second Renewal	<i>3-15 3-16</i>	<i>0700 0630</i>	<i>AT</i>	<i>C</i>	1	125	P	HNO3	Water	N	Metals Hard;
029	Effluent Second Renewal	<i>3-15 3-16</i>	<i>0700 0630</i>	<i>AT</i>	<i>C</i>	1	125	P	H2SO4	Water	N	NH3;
030	Receiving Water Second Renewal	<i>3-16-20</i>	<i>0815</i>	<i>AT</i>	<i>G</i>	1	3750	P	4 C	Water	N	CD7DCR 2ndRenewal Diluent
031	Receiving Water Second Renewal	<i>3-16-20</i>	<i>0815</i>	<i>AT</i>	<i>G</i>	1	125	P	4 C	Water	N	Alk
032	Receiving Water Second Renewal	<i>3-16-20</i>	<i>0815</i>	<i>AT</i>	<i>G</i>	1	125	P	HNO3	Water	N	Metals Hard;
033	Receiving Water Second Renewal	<i>3-16-20</i>	<i>0815</i>	<i>AT</i>	<i>G</i>	1	125	P	H2SO4	Water	N	NH3;

Relinquished By: <i>[Signature]</i>	Date: <i>3/16/20</i> Time: <i>0915</i>	Received By: <i>[Signature]</i>	Date: <i>3/16/20</i> Time: <i>915</i> Temp (C): <i>1.9</i>
Relinquished By: <i>[Signature]</i>	Date: <i>3/16/20</i> Time: <i>1200</i>	Received at Lab By: <i>[Signature]</i>	Date: <i>3/16/20</i> Time: <i>1200</i> Temp (C): <i>1.4</i>
Comments: <i>Effluent composite sample collected in 30 minute intervals from 0700 3-15-20 through 0630 3-16-20. 48 Total Grab Samples collected over 24hr. composite collection period.</i>			

COC Number: A1018535	Sample Delivery Group No: March 2020	Page 1 of 1
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** Receiving Water Sample collected upstream of Effluent discharge pipe from Nashua River off of M^cPherson Rd.*

Assay Review Checklist

DATE IN: 3/11/20

STUDY#: 33893

DATE DUE: 04/30/20

CLIENT: AYER

PROJECT:

ASSAY: CD48AD, CD7DCR

Project Paperwork Check for Completeness				
	Date	Analyst	Supervisor	Comments
Day 0	03/12/20	HED	BG	
Day 1	03/13	CFS	BG	
Day 2	03/14	CA	GRS	
Day 3	03/15/20	GRS	GRS	
Day 4	03/16/20	HED	GRS	
Day 5	03/17/20	HED	BG	
Day 6	03/18/20	PES	BG	
Day 7	03/19/20	HED	BG	
Day 8				

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete	03/24/20	BG	
Sample Receipt Complete		↓	
Organism Culture Sheet(s)		NA	
Bench Sheets Complete (dates, times, initials, etc...)		BG	
Water Quality Data Complete		↓	
TRC Values & Bottle Numbers		↓	
Daphnid Calculations Complete		↓	
Weights Reported		NR	
Assay Acceptability Review		BG	

Technical Report Review	Date	Initials	Comments
Statistical Analysis Complete	3/23/20	MW	
Statistical Analysis Reviewed	03/24/20	BG	
Data Acceptability Review	3/23/20	MW	
Supporting Chemistry Report	4/22/20	MW	
Draft Report	3/23/20	MW	
QA Audit/Review Complete			
Final Report Reviewed	4/21/20	NR	
Final Report Printed - PDF	4/22/20	MW	
Executive Summary / Chems Sent			
Report E-mailed / Faxed	4/22/20	MW	
Report Logged Out / Invoice Sent	↓	↓	
Report Scanned to Archive	↓	↓	

Q:\Forms\Lab Forms\Archive and stuff that belongs in folder\Assay Review Checklist 06-13-19 Update.wpd



Leaders in Environmental Toxicology & Chemistry

January 15, 2020

Ms. Paula Boyle
Hoyle, Tanner and Associates Inc.
150 Dow Street
Manchester, New Hampshire 03101

Dear Ms. Boyle:

Enclosed, please find a copy of our report evaluating results of toxicity tests completed on effluent samples collected from the Ayer, Massachusetts Wastewater Treatment Facility in December 2019. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

Please do not hesitate to call me should you have any questions regarding the report.

Sincerely,

Enthalpy Analytical, LLC

A handwritten signature in black ink that reads 'Meredith Wheeler'.

Meredith Wheeler
Project Manager

Enclosure
WET Test Report Certification
Report 32593-19-12
E-mail only

cc: Rick Hudson

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION

Permittee Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: _____

Authorized Signature

Print or Type Name

Town of Ayer Board of Selectmen

Print or Type the Permittee's Name

MA0100013

Type or Print the NPDES Permit No.

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION (Bioassay Laboratory)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: January 15, 2020



Kirk Cram
Laboratory Director - Enthalpy Analytical, LLC

January 15, 2020

Mr. Rick Hudson
Ayer Department of Public Works
25 Brook Street
Ayer, Massachusetts 01432

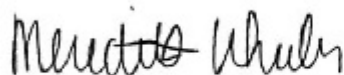
Dear Mr. Hudson:

Enclosed, please find a copy of our report evaluating results of toxicity tests completed on effluent samples collected from the Ayer, Massachusetts Wastewater Treatment Facility in December 2019. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

Please do not hesitate to call me should you have any questions regarding the report.

Sincerely,

Enthalpy Analytical, LLC



Meredith Wheeler
Project Manager

Enclosure

WET Test Report Certification
Report 32593-19-12
Email only

cc: Paula Boyle

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION

Permittee Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: _____

Authorized Signature

Print or Type Name

Town of Ayer Board of Selectmen

Print or Type the Permittee's Name

MA0100013

Type or Print the NPDES Permit No.

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Executed on: January 15, 2020



Kirk Cram
Laboratory Director - Enthalpy Analytical, LLC



**TOXICOLOGICAL EVALUATION
OF A TREATED MUNICIPAL EFFLUENT
BIOMONITORING SUPPORT FOR A NPDES PERMIT:
December 2019**

Ayer Wastewater Treatment Facility
Ayer, Massachusetts
NPDES Permit Number MA0100013

Prepared For:

Hoyle, Tanner and Associates Inc.
150 Dow Street
Manchester, New Hampshire 03101

Prepared By:

Enthalpy Analytical, LLC
One Lafayette Road
Hampton, New Hampshire 03842

December 2019
Reference Number: Ayer32593-19-12

STUDY NUMBER 32593

EXECUTIVE SUMMARY

The following summarizes the results of acute and chronic exposure bioassays performed during December 2019 using samples collected from the Ayer, Massachusetts Wastewater Treatment Facility. Samples were provided by Civil and Environmental Consultants, Inc., Raynham, Massachusetts. Acute and chronic toxicity was evaluated using the freshwater species, *Ceriodaphnia dubia*.

Test organisms used for the assays were <24 hours old *C. dubia* derived from Enthalpy culture. Dilution water was receiving water collected from the Nashua River upstream of the discharge. Samples were received under chain of custody in good order. All sample receipt, test conditions and control endpoints were within protocol specifications, except where otherwise noted.

The results presented in this report relate only to the samples described on the chain(s) of custody and sample receipt log(s), and are intended to be used only by the submitter. Results from the chronic and acute exposure assays and their relationship to permit limits are summarized in the following matrix.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Effluent Meets Permit Limit	Assay Meets Protocol Limits
<i>Ceriodaphnia dubia</i>	48 Hours	>100%	NC	>100%	Yes	Yes

Chronic Toxicity Evaluation

Species	Exposure	C-NOEC	IC-25	Permit Limit (C-NOEC)	Effluent Meets Permit Limit	Assay Meets Protocol Limits
<i>Ceriodaphnia dubia</i> ^a	7 Days	100%	NC	>7.7%	Yes	Yes

COMMENTS:

NC = Not Calculated.

**TOXICOLOGICAL EVALUATION
OF A TREATED MUNICIPAL EFFLUENT
BIOMONITORING SUPPORT FOR A NPDES PERMIT:
December 2019**

Ayer Wastewater Treatment Facility
Ayer, Massachusetts
NPDES Permit Number MA0100013

1.0 INTRODUCTION

This report presents the results of toxicity tests completed on a series of composite effluent samples collected from the Ayer, Massachusetts Wastewater Treatment Facility (Ayer WWTF). Samples were provided by Civil and Environmental Consultants, Inc., Raynham, Massachusetts. Testing was based on programs and protocols developed by the US EPA (2002), with exceptions as noted by US EPA Region I (2011, 2013), and involved conducting acute and chronic toxicity tests with the daphnid, *Ceriodaphnia dubia*. Testing was conducted at Enthalpy Analytical, LLC (Enthalpy), Hampton, New Hampshire in accordance with the provisions of TNI Standards (2009).

Acute toxicity tests involve preparing a series of test concentrations by diluting effluent with control water. Groups of test animals are exposed to each test concentration and a control for a specified period. The mortality data for each concentration can be used to calculate the median lethal concentration or LC-50, defined as the concentration of effluent that kills half of the test animals. Samples with a high LC-50 value are less likely to cause significant environmental impacts. These data can also be analyzed to determine the no effect level. This Acute No Observed Effect Concentration (A-NOEC) is defined as the highest tested effluent concentration that causes no significant mortality. Chronic toxicity tests measure sublethal effects, exposing test organisms to samples during a sensitive period in the life cycle. Daphnid chronic tests measure survival and juvenile production. Using Analysis of Variance techniques to evaluate the data, it is possible to determine the lowest tested concentration that had an effect (C-LOEC) and the highest tested concentration where no effect (C-NOEC) was observed. An Inhibition Concentration (IC) may be calculated by linear interpolation to confirm the C-NOEC in situations where a non-standard dose-response or sample toxicity are encountered. The IC-25 is calculated to best approximate the C-NOEC (US EPA 2000). An Inhibition Concentration (IC) may be calculated by linear interpolation to confirm the C-NOEC in situations where a non-standard dose-response or sample toxicity are encountered. The IC-25 is calculated to best approximate the C-NOEC (US EPA 2000).

2.0 MATERIALS AND METHODS

2.1 General Methods

Toxicological and analytical protocols used in this program follow procedures primarily designed to provide standard approaches for the evaluation of toxicological effects of discharges on aquatic organisms (US EPA 2002), and for the analysis of water samples (APHA 2012). See Section 4.0 for a list of references.

2.2 Test Species

C. dubia were maintained in laboratory water at $25\pm 1^{\circ}\text{C}$ with a photoperiod of 16:8 hours light:dark. Cultures are fed daily with a yeast/trout chow/Cerophyll or alfalfa leaves (YTC) mixture supplemented with *Pseudokirchneriella subcapitata* (algae) (US EPA 2002). Adults on a brood board were isolated 24 hours prior to test start.

2.3 Effluent, Receiving Water and Laboratory Water

Effluent and receiving water collection information is provided in Table 1. Samples were received at $0-6^{\circ}\text{C}$ as per 40 CFR §136.3 unless otherwise noted, stored at $4\pm 2^{\circ}\text{C}$ and warmed to $25\pm 1^{\circ}\text{C}$ prior to preparing test solutions. Laboratory water was synthetic reconstituted water prepared at Enthalpy according to protocol (US EPA 2002). This water has been used to successfully culture freshwater organisms since 1992.

Total residual chlorine (TRC) was measured by amperometric titration (MDL 0.02 mg/L) in the effluent samples prior to use in the assays. Samples with ≥ 0.02 mg/L TRC were dechlorinated using sodium thiosulfate (US EPA 2002) and a control treatment using laboratory water adjusted with the same amount of sodium thiosulfate used to dechlorinate the effluent was run concurrently with the assay. If sample pH measured < 6.0 SU or > 9.0 SU, samples were adjusted using sodium hydroxide or hydrochloric acid, respectively, and a control treatment using laboratory water adjusted with the same amount of either compound used to modify sample pH was run concurrently with the assay. When applicable, data from sodium thiosulfate and/or pH adjusted laboratory control treatments can be found in Appendix A.

2.4 Acute Exposure Bioassay

The 48 hour static acute assay was conducted at 25 ± 1 °C with a photoperiod of 16:8 hours light:dark. Test concentrations were 100% (undiluted), 50%, 25%, 12.5%, and 6.25% effluent. Daphnids were maintained in 30 mL test chambers with approximately 20 mL of test solution in each of 4 replicates with 5 organisms/replicate. Test organisms were derived from a pool of mixed organisms recovered from Enthalpy's culture the morning of testing. All organisms used were recovered from the same type of culture water.

Survival in all test replicates was recorded daily. A fifth replicate in the daphnid assay was included as a surrogate test chamber to obtain daily water qualities without disturbing the test animals, and was treated the same as actual test chambers with the addition of animals and food, but was not used to determine endpoint data. Dissolved oxygen, pH and temperature were measured daily, and specific conductivity was measured at the start of the assay.

2.5 Chronic Exposure Bioassay

The chronic exposure bioassay was conducted according to protocol (US EPA 2002), which called for the daily renewal of test solutions. Test treatments were 100% (undiluted), 50%, 25%, 12.5%, 7.7%, and 6.25% effluent. Dissolved oxygen, pH, temperature, and specific conductivity were measured in each new and old test solution.

Test chambers for the daphnid assay were 30 mL portion cups containing approximately 20 mL of test solution in each of 10 replicates with 1 organism/replicate. Replicates were not randomized during testing; rather, organisms were added at test initiation by blocking by known parentage. Survival and juvenile production were monitored daily. Daphnids were each fed 200 μ L of a mixture of YTC and algae after daily renewals.

2.6 Data Analysis

Statistical analysis of acute and chronic exposure data was completed using CETIS™ v1.9.6.3, Comprehensive Environmental Toxicity Information System, software. The program computes acute and chronic exposure endpoints based on US EPA decision tree guidelines specified in individual test methods. If survival in the highest test concentration is $> 50\%$, the LC-50 is obtained by direct observation of the raw data. The A-NOEC is determined as the highest test concentration that causes no significant mortality. For chronic exposure endpoints statistical significance was accepted at $\alpha = 0.05$. For statistical calculations of *C. dubia* juvenile production, data from only the first three broods are used.

3.0 RESULTS AND DISCUSSION

Results of the acute exposure assay completed using *C. dubia* are presented in Table 3, and chronic results can be found in Table 4. Water quality data collected during the assays are summarized in Table 5. US EPA Region I Attachment F toxicity test summary sheets are provided after the tables. Support data, including copies of laboratory bench sheets, are provided in Appendix A.

3.1 Acute Exposure Bioassay - *Ceriodaphnia dubia*

Minimum test acceptability criteria require $\geq 90\%$ survival in the control concentrations. Achievement of these results indicates that healthy test organisms were used and that the dilution water had no significant adverse impact on the outcome of the assay. See the Executive Summary and Table 3 for test acceptability.

3.2 Chronic Exposure Bioassay - *Ceriodaphnia dubia*

Minimum test acceptability criteria require 80% control survival, mean reproduction of 15 juveniles/female, production of 3 broods by at least 60% of control females, and the MSDp for reproduction to be <47% (US EPA 2002). Achievement of these results indicates that healthy test organisms were used and that the dilution water had no significant adverse impact on the outcome of the assay. See the Executive Summary and Table 4 for test acceptability.

4.0 LITERATURE CITED

40 CFR §136.3. *Code of Federal Regulations* (CFR), Protection of the Environment (Title 40), Guidelines Establishing Test Procedures for the Analysis of Pollutants (Part 136), Identification of Test Procedures (sub-part 3), Table II-Required Containers, Preservation Techniques, and Holding Times.

APHA. 2012. *Standard Methods for the Examination of Water and Wastewater*, 22nd Edition. Washington D.C.

The NELAC Institute (TNI). 2009. *Environmental Laboratory Sector, Volume 1: Management and Technical Requirements for Laboratories Performing Environmental Analysis (TNI Standard)*. EL-V1-2009.

US EPA. 2000. *Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing (40 CFR Part 136)*. EPA 821-B-00-004.

US EPA. 2002. *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms*. Fifth Edition. EPA-821-R-02-012.

US EPA. 2002. *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*. Fourth Edition. EPA-821-R-02-013.

US EPA Region I. 2011. *US EPA Region 1 Freshwater Acute Toxicity Test Procedure and Protocol*. US EPA Region I Office, Boston, Massachusetts. February 28, 2011.

US EPA Region I. 2013. *Freshwater Chronic Toxicity Test Procedure and Protocol - US EPA Region I*. US EPA Region I Office, Boston, Massachusetts. December 2013.

**TABLE 1. Summary of Sample Collection Information.
Ayer WWTF Effluent Evaluation. December 2019.**

Sample Description	Type	Collection		Receipt		Arrival Temp °C
		Date	Time	Date	Time	
EFFLUENT						
Start	Comp	12/10-11/19	0700-0630	12/11/19	1000	1
First Renewal	Comp	12/13-14/19	0820-0750	12/14/19	0920	6
Second Renewal	Comp	12/15-16/19	0700-0630	12/16/19	1010	1
RECEIVING WATER						
Start	Grab	12/11/19	0745	12/11/19	1000	1
First Renewal	Grab	12/13/19	0900	12/14/19	0920	6
Second Renewal	Grab	12/16/19	0855	12/16/19	1010	1

**TABLE 2. Summary of Reference Toxicant Data.
Ayer WWTF Effluent Evaluation. December 2019.**

Date	Endpoint		Value	Historic Mean/ Central Tendency	Acceptable Range	Reference Toxicant
<i>C. dubia</i>						
11/21/19	Survival	LC-50	33.4	24.2	6.2 - 42.1	SDS (mg/L)
10/29/19	Survival	C-NOEC	15.0	30.0	15.0 - 60.0	Copper (µg/L)
10/29/19	Reproduction	C-NOEC	15.0	15.0	7.5 - 30.0	Copper (µg/L)
10/29/19	Reproduction	MSDp	40.8	29.4	11.3 - 47.6	Copper (µg/L)

**TABLE 3. *C. dubia* Acute Exposure Assay Data Summary.
Ayer WWTF Effluent Evaluation. December 2019.**

Species	Exposure	LAB	Percent Survival					
			RW	6.25%	12.5%	25%	50%	100%
<i>C. dubia</i>	48 hours	100%	100%	100%	95%	100%	95%	95%

LC-50 and A-NOEC Results						
Species	Exposure	Spearman-Kärber	Probit	Direct Observation	A-NOEC	
<i>C. dubia</i>	48 Hours	NC	NC	>100%	NC	

COMMENTS:

NC = Not Calculated.

RW = Receiving Water; used as the diluent.

**TABLE 4. *C. dubia* Chronic Exposure Assay Data Summary.
Ayer WWTF Effluent Evaluation. December 2019.**

Conc.	Mean Percent Survival	Mean Reproduction (Juv/Female)	% Females Producing 3 Broods	Is There a Significant Difference Based on	
	Day 7			Survival (%)	Reproduction
LAB	100%	39.0	100%	-	-
RW	90%	34.5	90%	-	-
6.25%	100%	32.5	80%	No	No
7.7%	100%	35.8	100%	No	No
12.5%	100%	36.2	100%	No	No
25.0%	100%	34.7	90%	No	No
50.0%	100%	30.1	90%	No	No
100.0%	100%	29.8	90%	No	No

MSDp = 25.4%

NOEC = 100% NOEC = 100%

COMMENTS:

RW = Receiving Water; used as the diluent.

**TABLE 5. WET Support Chemistry Data.
Ayer WWTF Effluent Evaluation. December 2019.**

PARAMETER	UNITS	EFFLUENT	RECEIVING WATER
Specific Conductance	ì mhos/cm	1303	321
pH	SU	7.59	6.71
Total Residual Chlorine	mg/L	<0.02	-
Alkalinity	mg/L	200	13
Hardness	mg/L	190	29
Total Solids	mg/L	770	-
Total Dissolved Solids	mg/L	710	-
Ammonia	mg/L	<0.1	<0.1
Total Organic Carbon	mg/L	7.7	6.4
Aluminum, total	mg/L	0.035	0.42
Cadmium, total	mg/L	<0.0003	0.0003
Calcium, total	mg/L	56.7	9.1
Copper, total	mg/L	0.0057	0.0054
Lead, total	mg/L	0.0003	0.0059
Magnesium, total	mg/L	9.3	1.47
Nickel, total	mg/L	0.0032	0.0014
Zinc, total	mg/L	0.023	0.023

COMMENTS:

Additional water quality and analytical support data are provided in Appendix A.

TOXICITY TEST SUMMARY SHEET

FACILITY NAME: Ayer WWTF TEST START DATE: 12/12/19
 NPDES PERMIT NO.: MA0100013 TEST END DATE: 12/14/19

TEST TYPE	TEST SPECIES	SAMPLE TYPE	SAMPLE METHOD
<input checked="" type="checkbox"/> Acute	<input type="checkbox"/> <i>Pimephales promelas</i>	<input type="checkbox"/> Prechlorinated	<input type="checkbox"/> Grab
<input type="checkbox"/> Chronic	<input checked="" type="checkbox"/> <i>Ceriodaphnia dubia</i>	<input type="checkbox"/> Dechlorinated	<input checked="" type="checkbox"/> Composite
<input type="checkbox"/> Modified Chronic (Reporting Acute Values)	<input type="checkbox"/> <i>Daphnia pulex</i>	<input type="checkbox"/> Chlorine Spiked in Lab	<input type="checkbox"/> Flow-thru
	<input type="checkbox"/> <i>Americamysis bahia</i>	<input type="checkbox"/> Chlorinated on Site	<input type="checkbox"/> Other
	<input type="checkbox"/> <i>Cyprinodon variegatus</i>	<input type="checkbox"/> Unchlorinated	
<input type="checkbox"/> 24 Hour Screen	<input type="checkbox"/> <i>Menidia beryllina</i>	<input checked="" type="checkbox"/> No Detectable Chlorine Upon Receipt	
	<input type="checkbox"/> <i>Arbacia punctulata</i>		

DILUTION WATER:

☒ Receiving water collected at a point upstream or away from the discharge, free from toxicity or other sources of contamination; Receiving Water Name: Nashua River

☐ Alternate surface water of known quality and hardness, to generally reflect the characteristics of the receiving water; Receiving Water Name: _____

☐ Synthetic water prepared using either Millipore Milli-Q or equivalent deionized water and reagent grade chemicals; or deionized water combined with mineral water.

☐ Artificial sea salts mixed with deionized water

☐ Deionized water and hypersaline brine

☐ Other

EFFLUENT SAMPLING DATES: 12/10-11/19

EFFLUENT CONCENTRATIONS TESTED (%): 6.25; 12.5; 25; 50; 100

Permit Limit Concentration: >100 %

Was the effluent salinity adjusted? No If yes, to what level? _____ppt

REFERENCE TOXICANT TEST DATE: 11/21/19 LC-50: 33.4 mg/L Sodium Dodecyl Sulfate

PERMIT LIMITS AND TEST RESULTS

Test Acceptability Criteria

Mean Diluent Control Survival: 100 %

LIMITS

LC-50: >100 %

A-NOEC: - %

RESULTS

LC-50 >100 %

Upper Limit: - %

Lower Limit: - %

Method: Direct Observation

A-NOEC: - %

TOXICITY TEST SUMMARY SHEET

FACILITY NAME: Ayer WWTF TEST START DATE: 12/12/19
 NPDES PERMIT NO.: MA0100013 TEST END DATE: 12/19/19

TEST TYPE	TEST SPECIES	SAMPLE TYPE	SAMPLE METHOD
<input type="checkbox"/> Acute	<input type="checkbox"/> <i>Pimephales promelas</i>	<input type="checkbox"/> Prechlorinated	<input type="checkbox"/> Grab
<input checked="" type="checkbox"/> Chronic	<input checked="" type="checkbox"/> <i>Ceriodaphnia dubia</i>	<input type="checkbox"/> Dechlorinated	<input checked="" type="checkbox"/> Composite
<input type="checkbox"/> Modified Chronic (Reporting Acute Values)	<input type="checkbox"/> <i>Daphnia pulex</i>	<input type="checkbox"/> Chlorine Spiked in Lab	<input type="checkbox"/> Flow-thru
	<input type="checkbox"/> <i>Americamysis bahia</i>	<input type="checkbox"/> Chlorinated on Site	<input type="checkbox"/> Other
	<input type="checkbox"/> <i>Cyprinodon variegatus</i>	<input type="checkbox"/> Unchlorinated	
<input type="checkbox"/> 24 Hour Screen	<input type="checkbox"/> <i>Menidia beryllina</i>	<input checked="" type="checkbox"/> No Detectable Chlorine Upon Receipt	
	<input type="checkbox"/> <i>Arbacia punctulata</i>		

DILUTION WATER:

☒ Receiving water collected at a point upstream or away from the discharge, free from toxicity or other sources of contamination; Receiving Water Name: Nashua River

☐ Alternate surface water of known quality and hardness, to generally reflect the characteristics of the receiving water; Receiving Water Name: _____

☐ Synthetic water prepared using either Millipore Milli-Q or equivalent deionized water and reagent grade chemicals; or deionized water combined with mineral water.

☐ Artificial sea salts mixed with deionized water

☐ Deionized water and hypersaline brine

☐ Other

EFFLUENT SAMPLING DATES: 12/10-11/19 12/13-14/19 12/15-16/19

EFFLUENT CONCENTRATIONS TESTED (%): 6.25; 7.7; 12.5; 25; 50; 100

Permit Limit Concentration: >7.7 %

Was the effluent salinity adjusted? ☐ No ☐ If yes, to what level? _____ ppt

REFERENCE TOXICANT TEST DATE: 10/29/19 NOEC: 15.0 µg/L Copper

PERMIT LIMITS AND TEST RESULTS

Test Acceptability Criteria

Mean Diluent Control Survival: 100 %

Mean # Juveniles/Female: 34.5
 MSDp: 25.4 %

LIMITS

C-NOEC: >7.7 %

IC- - %

RESULTS

C-NOEC: 100% %

C-LOEC: >100% %

IC- - %

APPENDIX A
DATA SHEETS
STATISTICAL SUPPORT

Contents	Number of Pages
Methods Used in NPDES Permit Biomonitoring Testing	1
Massachusetts DEP Accreditation Certification and Certified Parameter List	2
<u>Acute Exposure Bioassay</u>	
<i>C. dubia</i> Acute Reproduction Assay Bench Sheet	1
<i>C. dubia</i> Acute Reference Toxicant Analysis	1
<u>Chronic Exposure Bioassay</u>	
<i>C. dubia</i> Chronic Reproduction Assay Bench Sheets	2
<i>C. dubia</i> Chronic Reference Toxicant Analysis	3
<i>C. dubia</i> Survival and Reproduction Statistics	6
<i>C. dubia</i> - Blocking by Parentage Tracking Sheet	1
Water Quality Data Bench Sheets	2
Preparation of Dilutions and Record of Meters Used	4
Analytical Chemistry Support Data Summary Report	2
Sample Receipt Record	1
Chain of Custody	4
Assay Review Checklist	1
 Total Appendix Pages	 31

METHODS USED IN NPDES PERMIT BIOMONITORING TESTING

Parameter	Method
Acute Exposure Bioassays:	
<i>Ceriodaphnia dubia</i>	EPA-821-R-02-012 2002.0
<i>Daphnia pulex</i>	EPA-821-R-02-012 2021.0
<i>Pimephales promelas</i>	EPA-821-R-02-012 2000.0
<i>Americamysis bahia</i>	EPA-821-R-02-012 2007.0
<i>Menidia beryllina</i>	EPA-821-R-02-012 2006.0
<i>Cyprinodon variegatus</i>	EPA-821-R-02-012 2004.0
Chronic Exposure Bioassays:	
<i>Ceriodaphnia dubia</i>	EPA-821-R-02-013 1002.0
<i>Pimephales promelas</i>	EPA-821-R-02-013 1000.0
<i>Cyprinodon variegatus</i>	EPA-821-R-02-014 1004.0
<i>Menidia beryllina</i>	EPA-821-R-02-014 1006.0
<i>Arbacia punctulata</i>	EPA-821-R-02-014 1008.0
<i>Champia parvula</i>	EPA-821-R-02-014 1009.0
Trace Metals:	
Trace Metals	EPA 200.8/SW 6020, EPA 245.7
Hardness	EPA SW846 3rd Ed. 6010
Wet Chemistries:	
Alkalinity	EPA 310.2
Chlorine, Residual	Standard Methods 22 nd Edition - Method 4500-Cl D
Total Organic Carbon	Standard Methods 22 nd Edition - Method 5310 C
Specific Conductance	Standard Methods 22 nd Edition - Method 2510 B
Nitrogen - Ammonia	Standard Methods 22 nd Edition - Method 4500-NH ₃ G
pH	Standard Methods 22 nd Edition - Method 4500-H+ B
Solids, Total (TS)	Standard Methods 22 nd Edition - Method 2540 B
Solids, Total Dissolved (TDS)	Standard Methods 22 nd Edition - Method 2540 C
Solids, Total Suspended (TSS)	Standard Methods 22 nd Edition - Method 2540 D
Dissolved Oxygen	Standard Methods 22 nd Edition - Method 4500-O G

Please visit our web site at www.enthalpy.com/accreditations for a copy of our accreditations and state certifications.

The Commonwealth of Massachusetts



Department of Environmental Protection

Division of Environmental Laboratory Sciences

Senator William X. Wall Experiment Station

certifies

M-NH906

**ENTHALPY ANALYTICAL, LLC
1 LAFAYETTE RD
HAMPTON, NH 03842-0000**

Laboratory Director: **JASON HOBBS**

for the analysis of **NON POTABLE WATER (CHEMISTRY)**

pursuant to 310 CMR 42.00

This certificate supersedes all previous Massachusetts certificates issued to this laboratory. The laboratory is regulated by and shall be responsible for being in compliance with Massachusetts regulations at 310 CMR 42.00.

This certificate is valid only when accompanied by the latest dated Certified Parameter List as issued by the Massachusetts D.E.P. Contact the Division of Environmental Laboratory Sciences to verify the current certification status of the laboratory.

Certification is no guarantee of the validity of the data. This certification is subject to unannounced laboratory inspections.

A handwritten signature in dark ink, appearing to read "Oscar C. Pascual".

Director, Division of Environmental Laboratory Sciences

Issued: **01 JUL 2019**

Expires: **30 JUN 2020**

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Certified Parameter List as of: 02 AUG 2019

M-NH906 ENTHALPY ANALYTICAL, LLC
HAMPTON NH

NON POTABLE WATER (CHEMISTRY)	Effective Date	02 AUG 2019	Expiration Date	30 JUN 2020
<u>Analytes</u>			<u>Methods</u>	
ALUMINUM			EPA 200.8	
ANTIMONY			EPA 200.8	
ARSENIC			EPA 200.8	
BERYLLIUM			EPA 200.8	
CADMIUM			EPA 200.8	
CHROMIUM			EPA 200.8	
COBALT			EPA 200.8	
COPPER			EPA 200.8	
IRON			EPA 200.8	
LEAD			EPA 200.8	
MANGANESE			EPA 200.8	
MERCURY			EPA 245.7	
MOLYBDENUM			EPA 200.8	
NICKEL			EPA 200.8	
SELENIUM			EPA 200.8	
SILVER			EPA 200.8	
THALLIUM			EPA 200.8	
VANADIUM			EPA 200.8	
ZINC			EPA 200.8	
PH			SM 4500-H-B	
SPECIFIC CONDUCTIVITY			SM 2510B	
TOTAL DISSOLVED SOLIDS			SM 2540C	
ALKALINITY, TOTAL			EPA 310.2	
CHLORIDE			EPA 300.0	
SULFATE			EPA 300.0	
AMMONIA-N			SM 4500-NH3-B, G	
NITRATE-N			SM 4500-NO3-F	
KJELDAHL-N			SM 4500-NH3-B, G	
ORTHOPHOSPHATE			SM 4500-P-E	
PHOSPHORUS, TOTAL			SM 4500-P-B,E	
BIOCHEMICAL OXYGEN DEMAND			SM 5210B	
NON-FILTERABLE RESIDUE			SM 2540D	
OIL AND GREASE			EPA 1664	

DAPHNID ACUTE DEFINITIVE ASSAY

STUDY: 32593

CLIENT: Ayer

SAMPLE: Effluent

DILUENT: Receiving Water

SPECIES: *C. dubia*

LOT ID: 00cdFA121219

AGE: <24 Hours

Treatment	Rep	SURVIVAL			DO (mg/L)			pH (SU)			Temp (°C)			S/C (µmhos/cm)	Sample Chemistries	
		0	24	48	0	24	48	0	24	48	0	24	48	0		
Lab	Surr.	5	5	5	8.3	8.9	8.4	7.67	7.88	8.65	23	22	22	208	T. Metals:	002
	A	5	5	5											TOC:	003
	B	5	5	5											Alk.:	004
	C	5	5	5											Hard.:	005
	D	5	5	5											NH3:	006
Receiving Water	Surr.	5	5	5	10.2	8.9	8.3	6.87	7.73	7.82	24	22	22	316	TS/TDS:	007
	A	5	5	5											Batch Used	
	B	5	5	5												
	C	5	5	5											Selenastrum :	
	D	5	5	5												
6.25%	Surr.	5	5	5	10.0	9.1	8.4	6.98	7.77	7.83	24	22	22	373	YCT:	
	A	5	5	5												
	B	5	5	5											F-159	
	C	5	5	5												
	D	5	5	5												
12.5%	Surr.	5	5	5	9.9	8.9	8.4	7.12	7.94	7.97	24	22	22	440		
	A	5	5	5												
	B	5	4	4												
	C	5	5	5												
	D	5	5	5												
25%	Surr.	5	5	5	9.8	8.9	8.5	7.25	8.11	8.19	24	22	22	569		
	A	5	5	5												
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
50%	Surr.	5	5	5	9.7	8.9	8.4	7.52	8.33	8.33	24	22	22	806		
	A	5	5	5												
	B	5	5	5												
	C	5	5	5												
	D	5	4	4												
100%	Surr.	5	6	6	9.7	8.9	8.4	7.61	8.60	8.62	24	22	22	1290		
	A	5	4	4												
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
INC TEMP (°C)		25	25	25												
DATE		12/12/19	12/13	12/14	12/12/19	12/13/19	12/14/19									
TIME		1555	1630	1635	1525	1555	1545									
INITIALS		MS	LAG	CFS	MW	GRS	CA									

STANDARD REFERENCE TOXICANT ANALYSIS

Exposure: Acute - 48 Hours

Species: *Ceriodaphnia dubia*

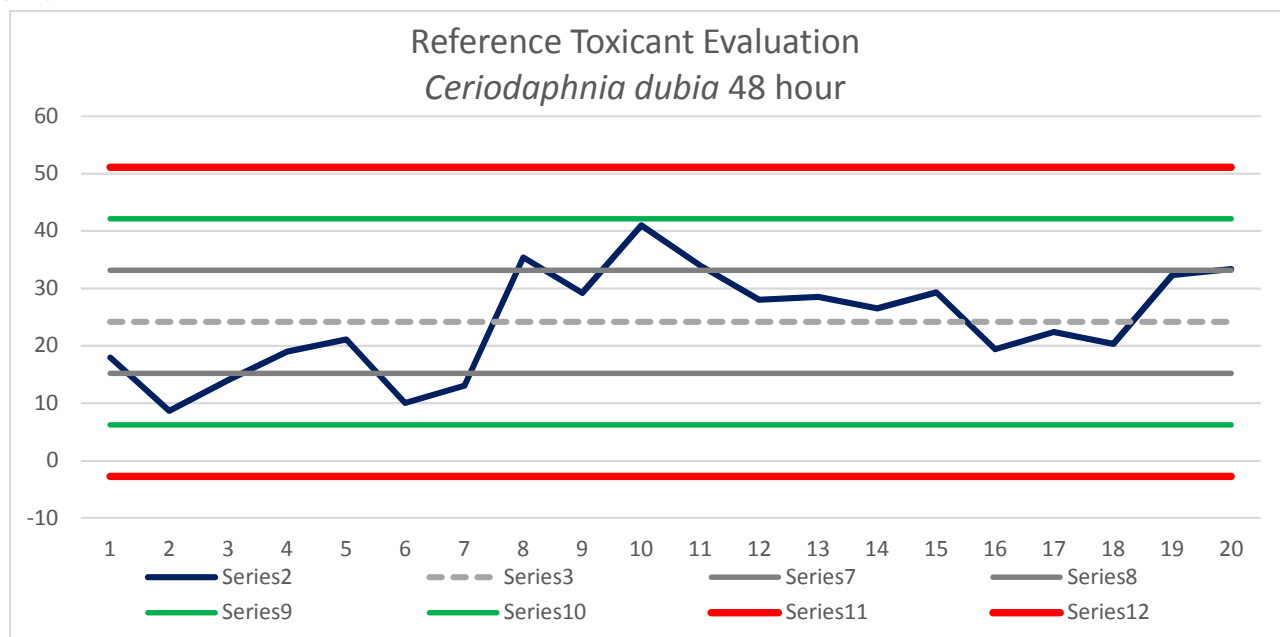
Toxicant: SDS

Temperature: 25C

Long Term Mean: 24.17 mg/L SDS

Long Term CV: 37%

Date		LC-50	Mean	Std Dev	2 Std Dev	CV	Mean -1 Std	Mean +1 Std	Mean -2 Std	Mean +2 Std	Mean -3 Std	Mean +3 Std
5/1/2018	1	17.9	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12
6/5/2018		8.66	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12
7/5/2018		14	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12
8/30/2018		19	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12
9/5/2018	5	21.1	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12
10/2/2018		10	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12
11/27/2018		13	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12
12/4/2018		35.4	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12
1/15/2019		29.2	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12
2/19/2019	10	41	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12
3/19/2019		34	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12
4/23/2019		28	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12
4/30/2019		28.5	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12
6/4/2019		26.5	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12
6/26/2019	15	29.3	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12
7/25/2019		19.4	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12
8/1/2019		22.4	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12
9/5/2019		20.3	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12
10/1/2019		32.3	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12
11/21/2019	20	33.4	24.17	8.98	17.97	37.17	15.18	33.15	6.20	42.14	-2.78	51.12



Issued by:

Reviewed by:

Ceriodaphnia dubia CHRONIC REPRODUCTION ASSAY

STUDY #	CONC.	DAY	A	B	C	D	E	F	G	H	I	J	SUM	SURV.
32593		0	+	+	+	+	+	+	+	+	+	+	0	10
CLIENT: AYER WWTF		1	+	+	+	+	+	+	+	+	+	+	0	10
SAMPLE: EFFLUENT		2	+	+	+	+	+	+	+	+	+	+	0	10
DILUENT: Receiving Water		3	5	+	+	+	+	6	+	+	6	+	235/175 817	10
	MSR	4	+	7	5	7	5	+	6	7	+	3	40	10
		5	8	+	10	+	12	14	+	+	13	12	69	10
		6	14	12	+	14	19	21	16	16	22	22	156	10
		7	+	22	19	21	+	+	23	23	+	+	108	10
		8												
		TOTAL	27	41	34	42	36	41	45	46	41	37	390	10
Cerio Data source: MSR <input type="checkbox"/> MHR <input checked="" type="checkbox"/> collected: previous pm <input type="checkbox"/> test day am <input checked="" type="checkbox"/>		0	+	+	+	+	+	+	+	+	+	+	0	10
DAY 0 12/12/19 TIME: 1515 FED: MS		1	+	+	+	+	+	+	+	+	+	+	0	9
DAY 1 12/13/19 TIME: 1525 FED: CA		2	+	+	+	+	+	+	+	+	+	+	0	9
DAY 2 12/14/19 TIME: 1545 FED: BG		3	+	+	+	+	+	5	+	+	5	+	10	9
DAY 3 12/15/19 TIME: 1450 FED: MS		4	+	8	5	8	6	+	7	6	+	5	45	9
DAY 4 12/16/19 TIME: 1355 FED: LAG		5	+	+	13	2	14	11	+	+	14	12	66	9
DAY 5 12/17/19 TIME: 1550 FED: CFS		6	+	13	+	13	+	12	13	14	18	+	83	9
DAY 6 12/18/19 TIME: 1610 FED: LCI		7	+	17	19	25	15	+	24	19	+	22	141	9
DAY 7 12/19 TIME: 1515 FED: LAG LCI		8	+											
DAY 8 TIME: FED:		TOTAL	0	38	37	48	35	28	44	39	37	39	345	9
	6.25%	0	+	+	+	+	+	+	+	+	+	+	0	10
		1	+	+	+	+	+	+	+	+	+	+	0	10
		2	+	+	+	+	+	+	+	+	+	+	0	10
		3	4	+	+	+	+	5	4	+	+	5	18	10
		4	+	7	7	7	+	+	7	4	8	8	48	10
		5	12	+	15	+	9	10	+	+	15	9	70	10
		6	12	14	+	17	8	12	16	13	+	16	98	10
		7	+	22	14	13	+	+	20	22	20	+	91	10
		8												
		TOTAL	28	43	36	37	22	26	43	39	28	23	325	10
LEGEND: + = LIVE - = DEAD σ = MALE M = MISSING		0	+	+	+	+	+	+	+	+	+	+	0	10
		1	+	+	+	+	+	+	+	+	+	+	0	10
		2	+	+	+	+	+	+	+	+	+	+	0	10
		3	4	+	+	+	+	4	+	+	5	+	13	10
		4	+	6	7	6	4	+	6	7	+	6	42	10
	7.7%	5	11	+	12	9	13	14	+	+	14	10	83	10
		6	14	16	1	1	9	14	17	15	+	+	87	10
		7	+	21	18	19	+	+	16	20	22	17	133	10
		8												
		TOTAL	29	43	38	35	26	32	39	42	41	33	358	10
Calculations: Initials: MW Date: 12/24/19														

100

90

80

100

Ceriodaphnia dubia CHRONIC REPRODUCTION ASSAY

STUDY #	CONC.	DAY	A	B	C	D	E	F	G	H	I	J	SUM	SURV.
32593		0	+	+	+	+	+	+	+	+	+	+	0	10
CLIENT: AYER WWTF	12.5%	1	+	+	+	+	+	+	+	+	+	+	0	10
		2	+	+	+	+	+	+	+	+	+	+	0	10
		3	4	+	+	+	+	5	+	+	5	+	14	10
4		+	6	6	6	7	+	7	8	+	6	46	10	
5		9	+	12	+	13	14	+	+	14	11	73	10	
6		16	13	+	11	12	20	17	16	15	+	120	10	
7		+	21	16	19	+	+	20	14	+	19	109	10	
8														
TOTAL		29	40	34	36	32	39	44	38	34	36	362	10	
DAY 1 12/13/19 TIME: 15:25 FED: CA	25%	0	+	+	+	+	+	+	+	+	+	+	0	10
		1	+	+	+	+	+	+	+	+	+	+	0	10
		2	+	+	+	+	+	+	+	+	+	+	0	10
3		5	+	+	+	+	5	+	+	4	+	14	10	
4		+	6	8	5	+	+	7	8	+	7	41	10	
5		8	+	7	(3)	12	12	+	13	14	12	81	10	
6		13	15	+	(2)	19	20	13	+	16	+	98	10	
7		+	22	22	17	+	+	21	17	+	14	113	10	
8														
TOTAL	26	43	37	27	31	37	41	38	34	33	347	10		
DAY 2 12/14/19 TIME: 15:45 FED: BG	50%	0	+	+	+	+	+	+	+	+	+	+	0	10
		1	+	+	+	+	+	+	+	+	+	+	0	10
		2	+	+	+	+	+	+	+	+	+	+	0	10
3		5	+	+	+	+	5	+	+	5	+	15	10	
4		+	8	5	6	+	+	4	5	+	4	32	10	
5		10	+	10	+	+	11	+	+	14	12	57	10	
6		17	14	+	15	+	13	9	16	12	13	111	10	
7		+	15	17	18	+	+	18	18	+	+	86	10	
8														
TOTAL	32	37	32	39	2	29	31	39	31	29	301	10		
DAY 3 12/15/19 TIME: 14:50 FED: MS	100%	0	+	+	+	+	+	+	+	+	+	+	0	10
		1	+	+	+	+	+	+	+	+	+	+	0	10
		2	+	+	+	+	+	+	+	+	+	+	0	10
3		4	+	+	+	5	4	+	+	4	+	28	10	
4		+	7	6	6	+	+	6	6	+	8	39	10	
5		(5)	+	11	+	10	11	+	11	10	12	70	10	
6		(3)	10	+	8	12	17	14	+	14	16	94	10	
7		+	16	14	12	+	+	18	18	+	+	78	10	
8														
TOTAL	12	33	31	26	27	32	38	35	28	36	298	10		
LEGEND:														
+= LIVE														
- = DEAD														
♂ = MALE														
M = MISSING														
Calculations:														
Initials: MW														
Date: 12/24/19														

STANDARD REFERENCE TOXICANT ANALYSIS

Exposure: 7 day Chronic

Species: Ceriodaphnia dubia

Toxicant: Copper - ug/L

Endpoint: Survival

DATE	C-NOEC	Mean	Std Dev	CV	CT	-1 Conc	+1 Conc	Notes
4/24/2018	1	30	27.00	6.16	22.80	60	30	120
6/5/2018	2	30	27.00	6.16	22.80	60	30	120
7/3/2018	3	30	27.00	6.16	22.80	60	30	120
8/28/2018	4	30	27.00	6.16	22.80	60	30	120
9/5/2018	5	30	27.00	6.16	22.80	30	15	60
10/2/2018	6	30	27.00	6.16	22.80	30	15	60
11/27/2018	7	30	27.00	6.16	22.80	30	15	60
12/4/2018	8	30	27.00	6.16	22.80	30	15	60
12/12/2018	9	30	27.00	6.16	22.80	30	15	60
1/15/2019	10	30	27.00	6.16	22.80	30	15	60
2/19/2019	11	30	27.00	6.16	22.80	30	15	60
3/19/2019	12	30	27.00	6.16	22.80	30	15	60
4/23/2019	13	15	27.00	6.16	22.80	30	15	60
4/30/2019	14	30	27.00	6.16	22.80	30	15	60
6/4/2019	15	30	27.00	6.16	22.80	30	15	60
7/30/2019	16	30	27.00	6.16	22.80	30	15	60
8/27/2019	17	30	27.00	6.16	22.80	30	15	60
9/24/2019	18	15	27.00	6.16	22.80	30	15	60
10/1/2019	19	15	27.00	6.16	22.80	30	15	60
10/29/2019	20	15	27.00	6.16	22.80	30	15	60

Acceptable	+ / - 1 mean
Range:	concentration
	7.5
	15
	30
	60
	120

STANDARD REFERENCE TOXICANT ANALYSIS

Exposure: 7 day Chronic

Species: Ceriodaphnia dubia

Toxicant: Copper - ug/L

Endpoint: Reproduction

DATE	C-NOEC	Mean	Std Dev	CV	CT	-1 Conc	+1 Conc	Notes
4/24/2018	1	30	22.13	8.24	37.26	30	15	60
6/5/2018	2	15	22.13	8.24	37.26	30	15	60
7/3/2018	3	15	22.13	8.24	37.26	30	15	60
8/28/2018	4	15	22.13	8.24	37.26	30	15	60
9/5/2018	5	30	22.13	8.24	37.26	30	15	60
10/2/2018	6	30	22.13	8.24	37.26	30	15	60 Lab Fails TAC
11/27/2018	7	30	22.13	8.24	37.26	30	15	60 MSDp fails. Based on IC-25 = 33.5
12/4/2018	8	30	22.13	8.24	37.26	30	15	60
12/12/2018	9	30	22.13	8.24	37.26	30	15	60
1/15/2019	10	30	22.13	8.24	37.26	30	15	60
2/19/2019	11	30	22.13	8.24	37.26	30	15	60
3/19/2019	12	15	22.13	8.24	37.26	30	15	60
4/23/2019	13	7.5	22.13	8.24	37.26	30	15	60
4/30/2019	14	15	22.13	8.24	37.26	30	15	60
6/4/2019	15	30	22.13	8.24	37.26	30	15	60
7/30/2019	16	15	22.13	8.24	37.26	30	15	60
8/27/2019	17	30	22.13	8.24	37.26	30	15	60
9/24/2019	18	15	22.13	8.24	37.26	30	15	60
10/1/2019	19	15	22.13	8.24	37.26	30	15	60
10/29/2019	20	15	22.13	8.24	37.26	15	7.5	30

Acceptable	+ / - 1 mean
Range:	concentration
	7.5
	15
	30
	60
	120

STANDARD REFERENCE TOXICANT ANALYSIS

Exposure: 7 day Chronic

Species: *Ceriodaphnia dubia*

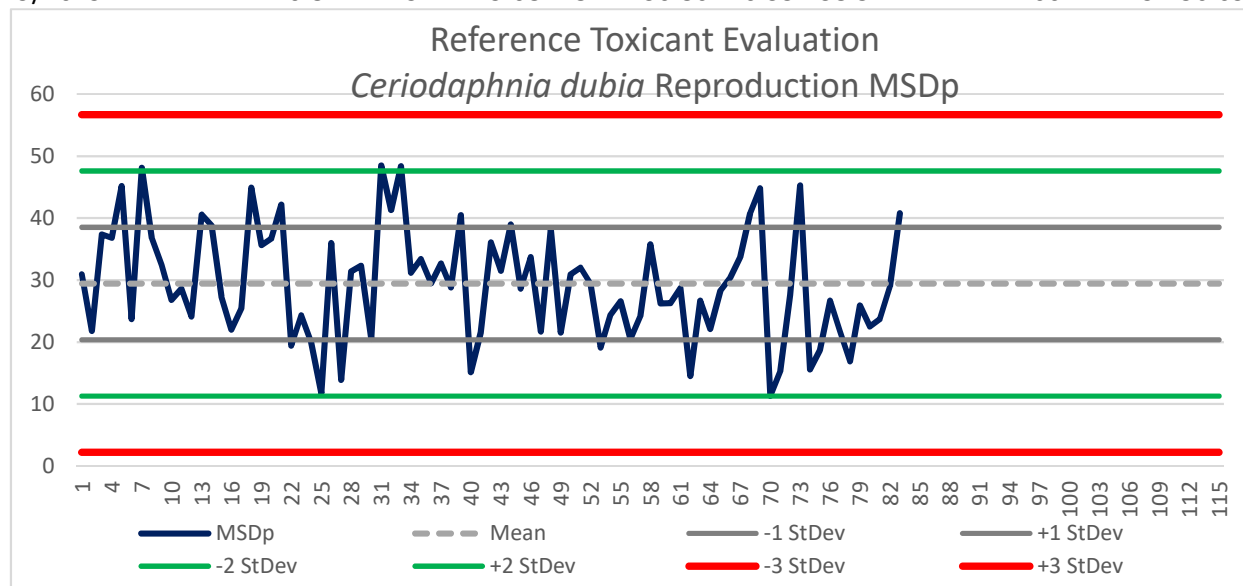
Toxicant: Copper - ug/L

Temperature: 25C

Long Term Mean: 29.43735

Long Term CV: 31%

Date		MSDp	Mean	Std Dev	2 Std Dev	CV	Mean -1 Std	Mean +1 Std	Mean -2 Std	Mean +2 Std	Mean -3 Std	Mean +3 Std
4/24/2018		22.1	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69
6/5/2018	65	28.3	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69
7/3/2018		30.4	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69
8/28/2018		33.7	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69
9/5/2018		40.8	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69
10/2/2018		44.8	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69
11/27/2018	70	11.3	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69
12/4/2018		15.3	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69
12/12/2018		27.6	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69
1/15/2019		45.3	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69
2/19/2019		15.6	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69
3/19/2019	75	18.7	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69
4/23/2019		26.7	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69
4/30/2019		21.7	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69
6/4/2019		16.9	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69
7/30/2019		25.9	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69
8/27/2019	80	22.5	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69
9/24/2019		23.7	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69
10/1/2019		29	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69
10/29/2019		40.8	29.44	9.08	18.17	30.86	20.35	38.52	11.27	47.60	2.19	56.69



Issued by:

Reviewed by:

CETIS Test Data Worksheet

Report Date: 24 Dec-19 09:19 (p 1 of 3)

Test Code/ID: 32593Cd / 17-1281-0267

Ceriodaphnia 7-d Survival and Reproduction Test

Enthalpy Analytical, LLC

Start Date: 12 Dec-19 15:15 Species: Ceriodaphnia dubia Sample Code: 32593Cd
 End Date: 19 Dec-19 15:00 Protocol: EPA/821/R-02-013 (2002) Sample Source: Ayer WWTF
 Sample Date: 11 Dec-19 06:30 Material: WWTP, Municipal Treatment Plant Sample Station: MA0100013; Final Discharge

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male	Notes
0	MS	1	64	1							1	27 ✓	0	
0	MS	2	65	1							1	41 ✓	0	
0	MS	3	62	1							1	34 ✓	0	
0	MS	4	27	1							1	42 ✓	0	
0	MS	5	26	1							1	36 ✓	0	
0	MS	6	22	1							1	41 ✓	0	
0	MS	7	21	1							1	45 ✓	0	
0	MS	8	6	1							1	46 ✓	0	
0	MS	9	14	1							1	41 ✓	0	
0	MS	10	50	1							1	37 ✓	0	
0	RW	1	70	1							0	0 ✓	0	
0	RW	2	32	1							1	38 ✓	0	
0	RW	3	19	1							1	37 ✓	0	
0	RW	4	71	1							1	48 ✓	0	
0	RW	5	16	1							1	35 ✓	0	
0	RW	6	45	1							1	28 ✓	0	
0	RW	7	59	1							1	44 ✓	0	
0	RW	8	25	1							1	39 ✓	0	
0	RW	9	49	1							1	37 ✓	0	
0	RW	10	24	1							1	39 ✓	0	
6.25		1	12	1							1	28 ✓	0	
6.25		2	53	1							1	43 ✓	0	
6.25		3	61	1							1	36 ✓	0	
6.25		4	8	1							1	37 ✓	0	
6.25		5	4	1							1	22 ✓	0	
6.25		6	38	1							1	26 ✓	0	
6.25		7	10	1							1	43 ✓	0	
6.25		8	33	1							1	39 ✓	0	
6.25		9	79	1							1	28 ✓	0	
6.25		10	68	1							1	23 ✓	0	
7.7		1	60	1							1	29 ✓	0	
7.7		2	39	1							1	43 ✓	0	
7.7		3	76	1							1	38 ✓	0	
7.7		4	73	1							1	35 ✓	0	

CETIS Test Data Worksheet

Report Date: 24 Dec-19 09:19 (p 2 of 3)
Test Code/ID: 32593Cd / 17-1281-0267

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male	Notes
7.7		5	67	1							1	26 ✓	0	
7.7		6	41	1							1	32 ✓	0	
7.7		7	58	1							1	39 ✓	0	
7.7		8	56	1							1	42 ✓	0	
7.7		9	30	1							1	41 ✓	0	
7.7		10	2	1							1	33 ✓	0	
12.5		1	52	1							1	29 ✓	0	
12.5		2	35	1							1	40 ✓	0	
12.5		3	48	1							1	34 ✓	0	
12.5		4	63	1							1	36 ✓	0	
12.5		5	74	1							1	32 ✓	0	
12.5		6	36	1							1	39 ✓	0	
12.5		7	77	1							1	44 ✓	0	
12.5		8	69	1							1	38 ✓	0	
12.5		9	34	1							1	34 ✓	0	
12.5		10	66	1							1	36 ✓	0	
25		1	51	1							1	26 ✓	0	
25		2	15	1							1	43 ✓	0	
25		3	29	1							1	37 ✓	0	
25		4	42	1							1	27 ✓	0	
25		5	55	1							1	31 ✓	0	
25		6	72	1							1	37 ✓	0	
25		7	13	1							1	41 ✓	0	
25		8	37	1							1	38 ✓	0	
25		9	40	1							1	34 ✓	0	
25		10	23	1							1	33 ✓	0	
50		1	7	1							1	32 ✓	0	
50		2	5	1							1	37 ✓	0	
50		3	11	1							1	32 ✓	0	
50		4	28	1							1	39 ✓	0	
50		5	20	1							1	2 ✓	0	
50		6	54	1							1	29 ✓	0	
50		7	78	1							1	31 ✓	0	
50		8	1	1							1	39 ✓	0	
50		9	57	1							1	31 ✓	0	
50		10	75	1							1	29 ✓	0	
100		1	3	1							1	12 ✓	0	
100		2	9	1							1	33 ✓	0	

CETIS Test Data Worksheet

Report Date: 24 Dec-19 09:19 (p 3 of 3)
 Test Code/ID: 32593Cd / 17-1281-0267

Conc-%	Code	Rep	Pos	# Exposed	1d Survival	2d Survival	3d Survival	4d Survival	5d Survival	6d Survival	7d Survival	Neonates	Male	Notes
100		3	47	1							1	31 ✓	0	
100		4	80	1							1	26 ✓	0	
100		5	18	1							1	27 ✓	0	
100		6	46	1							1	32 ✓	0	
100		7	44	1							1	38 ✓	0	
100		8	31	1							1	35 ✓	0	
100		9	17	1							1	28 ✓	0	
100		10	43	1							1	36 ✓	0	

CETIS Summary Report

Report Date: 24 Dec-19 09:20 (p 1 of 1)
Test Code/ID: 32593Cd / 17-1281-0267

Ceriodaphnia 7-d Survival and Reproduction Test								Enthalpy Analytical, LLC				
Batch ID:	15-0555-3062	Test Type:	Reproduction-Survival (7d)				Analyst:	Meredith Wheeler				
Start Date:	12 Dec-19 15:15	Protocol:	EPA/821/R-02-013 (2002)				Diluent:	Receiving Water				
Ending Date:	19 Dec-19 15:00	Species:	Ceriodaphnia dubia				Brine:	Not Applicable				
Test Length:	7d	Taxon:	Branchiopoda				Source:	In-House Culture		Age: <24		
Sample ID:	02-2168-5224	Code:	32593Cd				Project:	Fourth Quarter WET Compliance Test				
Sample Date:	11 Dec-19 06:30	Material:	WWTP, Municipal Treatment Plant				Source:	Ayer WWTF				
Receipt Date:	11 Dec-19 10:00	CAS (PC):					Station:	MA0100013; Final Discharge				
Sample Age:	33h (1 °C)	Client:	Town of Ayer, DPW									
Multiple Comparison Summary												
Analysis ID	Endpoint	Comparison Method					✓	NOEL	LOEL	TOEL	TU	PMSD S
12-6894-9914	7d Proportion Survived	Fisher Exact/Bonferroni-Holm Test						100	>100	n/a	1	n/a 1
03-9021-4998	Reproduction	Steel Many-One Rank Sum Test						100	>100	n/a	1	25.4% 1
7d Proportion Survived Summary												
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect	
0	MS	10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%	
0	RW	10	0.900	0.674	1.000	0.000	1.000	0.100	0.316	35.14%	10.00%	
6.25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%	
7.7		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%	
12.5		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%	
25		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%	
50		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%	
100		10	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%	
Reproduction Summary												
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect	
0	MS	10	39	35	43	27	46	1.79	5.66	14.50%	0.00%	
0	RW	10	34.5	25.1	43.9	0	48	4.18	13.2	38.29%	11.54%	
6.25		10	32.5	26.8	38.2	22	43	2.54	8.02	24.67%	16.67%	
7.7		10	35.8	31.7	39.9	26	43	1.82	5.75	16.06%	8.21%	
12.5		10	36.2	33.1	39.3	29	44	1.36	4.29	11.85%	7.18%	
25		10	34.7	30.7	38.7	26	43	1.77	5.6	16.13%	11.03%	
50		10	30.1	22.5	37.7	2	39	3.34	10.6	35.14%	22.82%	
100		10	29.8	24.5	35.1	12	38	2.34	7.39	24.80%	23.59%	
7d Proportion Survived Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10	
0	MS	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
0	RW	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
6.25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
7.7		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
12.5		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
25		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
50		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
100		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Reproduction Detail												
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10	
0	MS	27	41	34	42	36	41	45	46	41	37	
0	RW	0	38	37	48	35	28	44	39	37	39	
6.25		28	43	36	37	22	26	43	39	28	23	
7.7		29	43	38	35	26	32	39	42	41	33	
12.5		29	40	34	36	32	39	44	38	34	36	
25		26	43	37	27	31	37	41	38	34	33	
50		32	37	32	39	2	29	31	39	31	29	
100		12	33	31	26	27	32	38	35	28	36	

CETIS Analytical Report

Report Date: 24 Dec-19 09:20 (p 1 of 1)
Test Code/ID: 32593Cd / 17-1281-0267

Ceriodaphnia 7-d Survival and Reproduction Test			Enthalpy Analytical, LLC	
Analysis ID: 03-9021-4998	Endpoint: Reproduction	CETIS Version: CETISv1.9.6		
Analyzed: 24 Dec-19 9:19	Analysis: Nonparametric-Control vs Treatments	Status Level: 1		
Sample ID: 02-2168-5224	Code: 32593Cd	Project: Fourth Quarter WET Compliance Test		
Sample Date: 11 Dec-19 06:30	Material: WWTP, Municipal Treatment Plant	Source: Ayer WWTF		
Receipt Date: 11 Dec-19 10:00	CAS (PC):	Station: MA0100013; Final Discharge		
Sample Age: 33h (1 °C)	Client: Town of Ayer, DPW			

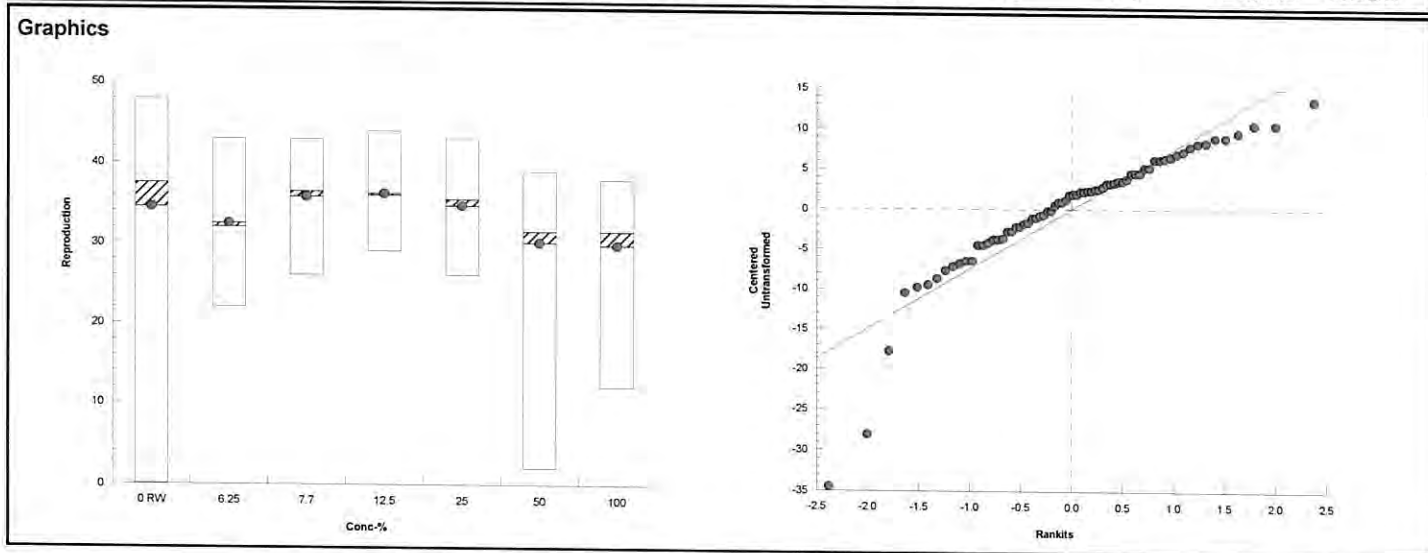
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	>100	n/a	1	25.35%

Steel Many-One Rank Sum Test									
Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Receiving Water		6.25	91	74	3	18	CDF	0.4201	Non-Significant Effect
		7.7	101	74	3	18	CDF	0.7588	Non-Significant Effect
		12.5	98	74	3	18	CDF	0.6663	Non-Significant Effect
		25	92.5	74	2	18	CDF	0.4733	Non-Significant Effect
		50	86	74	2	18	CDF	0.2584	Non-Significant Effect
		100	76.5	74	3	18	CDF	0.0686	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	411.543	68.5905	6	0.984	0.4439	Non-Significant Effect
Error	4392.8	69.727	63			
Total	4804.34		69			

ANOVA Assumptions Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variance	Bartlett Equality of Variance Test	15.7	16.8	0.0157	Equal Variances	
Distribution	Shapiro-Wilk W Normality Test	0.864	0.953	1.9E-06	Non-Normal Distribution	

Reproduction Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	RW	10	34.5	25.1	43.9	37.5	0	48	4.18	38.29%	0.00%
6.25		10	32.5	26.8	38.2	32	22	43	2.54	24.67%	5.80%
7.7		10	35.8	31.7	39.9	36.5	26	43	1.82	16.06%	-3.77%
12.5		10	36.2	33.1	39.3	36	29	44	1.36	11.85%	-4.93%
25		10	34.7	30.7	38.7	35.5	26	43	1.77	16.13%	-0.58%
50		10	30.1	22.5	37.7	31.5	2	39	3.34	35.14%	12.75%
100		10	29.8	24.5	35.1	31.5	12	38	2.34	24.80%	13.62%



CETIS Analytical Report

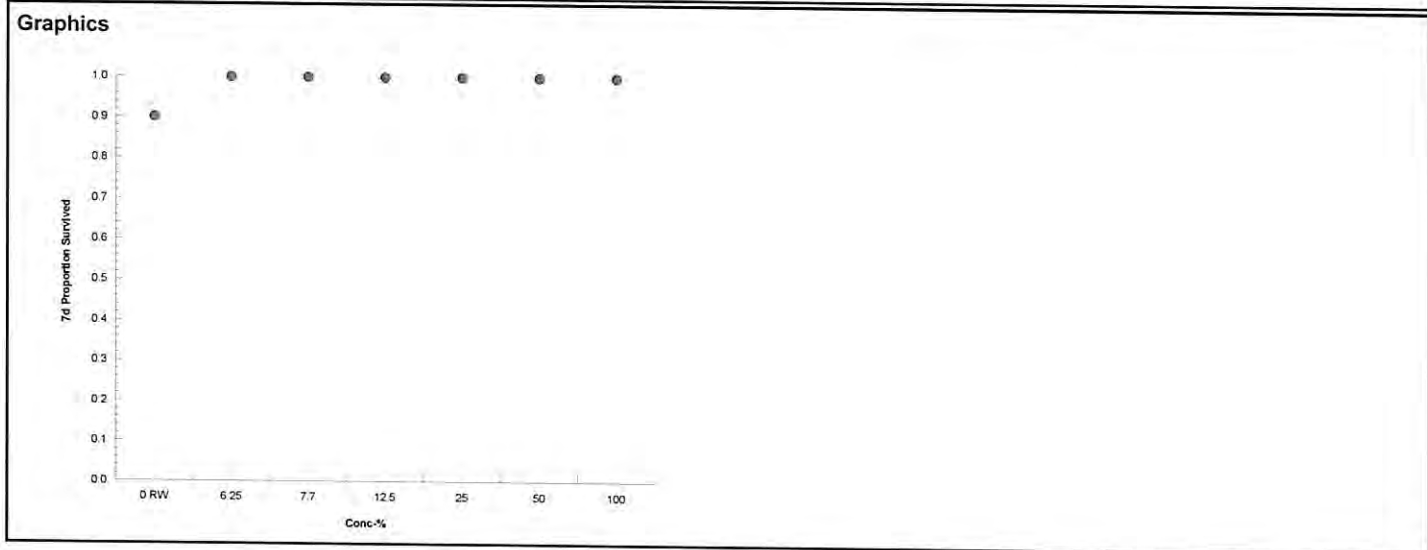
Report Date: 24 Dec-19 09:20 (p 1 of 1)
Test Code/ID: 32593Cd / 17-1281-0267

Ceriodaphnia 7-d Survival and Reproduction Test				Enthalpy Analytical, LLC	
Analysis ID: 12-6894-9914	Endpoint: 7d Proportion Survived	CETIS Version: CETISv1.9.6			
Analyzed: 24 Dec-19 9:19	Analysis: STP 2xK Contingency Tables	Status Level: 1			
Sample ID: 02-2168-5224	Code: 32593Cd	Project: Fourth Quarter WET Compliance Test			
Sample Date: 11 Dec-19 06:30	Material: WWTP, Municipal Treatment Plant	Source: Ayer WWTF			
Receipt Date: 11 Dec-19 10:00	CAS (PC):	Station: MA0100013; Final Discharge			
Sample Age: 33h (1 °C)	Client: Town of Ayer, DPW				

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	>100	n/a	1

Fisher Exact/Bonferroni-Holm Test						
Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Receiving Water		6.25	1.000	Exact	1.0000	Non-Significant Effect
		7.7	1.000	Exact	1.0000	Non-Significant Effect
		12.5	1.000	Exact	1.0000	Non-Significant Effect
		25	1.000	Exact	1.0000	Non-Significant Effect
		50	1.000	Exact	1.0000	Non-Significant Effect
		100	1.000	Exact	1.0000	Non-Significant Effect

Data Summary							
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	RW	9	1	10	0.9	0.1	10.0%
6.25		10	0	10	1	0	0.0%
7.7		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%



Ceriodaphnia dubia - Blocking By Parentage Tracking Sheet

ESI #: 32593

CLIENT: Ayer

START DATE: 12/12/19

START TIME: 1515

INITIAL: MS

COLUMN added to	<i>C. dubia</i> ADULT USED	
	board #	cup #
A	MHR 908	1A
B	↓	1B
C		1C
D		1D
E		1E
F		1F
G		2I
H		1J
I	MHR 909	1A
J	↓	1B

FRESHWATER CHRONIC ASSAY - NEW WATER QUALITIES
C. dubia

STUDY: 32593		CLIENT: Ayer, MA WWTF								SAMPLE: EFFLUENT		DILUENT: Receiving Water (RW)							
NEW DISSOLVED OXYGEN (mg/L)										pH (SU)									
CONC	REP	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7		
MSR	A	8.7	8.8	8.5	8.5	8.9	8.6	8.5		7.85	7.73	7.85	8.09	7.72	7.79	7.71			
RW	A	10.5	9.3	9.8	9.5	9.2	10.6	9.4		6.71	6.88	6.77	7.83	6.78	6.51	6.44			
6.25%	A	10.2	9.3	9.7	9.4	9.2	10.6	9.4		6.94	7.06	6.95	7.02	7.00	6.64	6.65			
7.7%	A	10.4	9.3	9.7	9.4	9.2	10.6	9.2		6.98	7.17	6.98	7.05	7.04	6.72	6.68			
12.5%	A	10.3	9.3	9.8	9.4	9.1	10.6	9.2		7.06	7.26	7.07	7.16	7.13	6.81	6.76			
25%	A	10.3	9.3	9.8	9.3	9.2	10.7	9.1		7.27	7.42	7.24	7.26	7.29	6.70	7.01			
50%	A	10.1	9.3	9.7	9.2	9.1	10.4	9.1		7.47	7.60	7.44	7.45	7.47	7.26	7.24			
100%	A	9.9	9.3	9.4	9.2	9.2	10.2	9.2		7.59	7.76	7.52	7.59	7.59	7.44	7.41			
NEW SPECIFIC CONDUCTIVITY (µmhos/cm)										NEW TEMPERATURE (°C)									
CONC	REP	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7		
MSR	A	209	208	211	204	208	214	213		23	22	24	22	22	24	23			
RW	A	321	321	298	289	295	209	207		23	23	24	22	23	24	23			
6.25%	A	384	388	378 ²	364	371	276	274		23	23	24	22	23	24	23			
7.7%	A	413	415	378	372	381	289	282		23	23	24	22	23	24	23			
12.5%	A	448	464	433	421	427	331	332		23	23	24	22	23	24	23			
25%	A	576	574	559	550	559	460	454		23	23	24	22	23	24	23			
50%	A	817	810	822	794	824	703	678		23	23	24	22	23	24	23			
100%	A	1303	1297	1321	1285	1313	1154	1155		23	23	24	22	23	24	23			
Inc. Temp. °C		25	25	25	25	25	25	25											
DATE:		12/12/19	12/13/19	12/14	12/15	12/16/19	12/17/19	12/18											
TIME:		1435	1230	1420	1350	1250	0905	1045											
INITIALS:		GRS	GRS	CFS	LAG	GRS	GRS	CFS											

RW = Receiving Water

12/16/19

DAY 0 (START)								DAY 1 (1 ST RENEWAL)				DAY 5 (2 ND RENEWAL)			
	METALS	TOC	ALK	HARD	AMM	TS/TDS	TRC	ALK	HARD	AMM	TRC	ALK	HARD	AMM	TRC
EFF	-002	-003	-004	-005	-006	-007	<0.02	-017	-018	-019	<0.02	-027	-028	-029	<0.02
RW	-009	-010	-011	-012	-013			-021	-022	-023		-031	-032	-033	

Did 1st Renewal sample cause ≥50% mortality? Yes _____ No X
If "YES" put into circulation TOC and METALS bottles. _____

Did 2nd Renewal sample cause ≥50% mortality? Yes _____ No X
If "YES" put into circulation TOC and METALS bottles. _____

Ceriodaphnia dubia CHRONIC REPRODUCTION ASSAY
OLD WATER QUALITIES

STUDY: 32593		CLIENT: Ayer, MA WWTF				SAMPLE: Effluent						
CONC	DAY	pH (SU)	Temp (°C)	DO (mg/L)	S/C (µMHOS/CM)	CONC	DAY	pH (SU)	Temp (°C)	DO (mg/L)	S/C (µMHOS/CM)	INIT
MSR	1	8.00	21	9.4	246	12.5%	1	7.76	21	8.8	498	LAG
	2	8.26	21	9.1	229		2	8.01	21	8.8	500	CA
	3	8.14	21	8.9	221		3	7.95	20	8.7	453	LAG
	4	7.95	22	9.1	231		4	7.79	21	9.1	456	MB
	5	7.83 7.47	21 21	9.9 9.0	264 236		5	7.77 7.59	21 21	9.6 8.8	498 411	LAG CA
	6	7.86	20	9.0	249		6	7.65	21	8.8	391	CA
	7	7.94	19	9.5	241		7	7.66	18	9.4	369	LCS
	8						8					
RW	1	7.81	21	9.1	303	25%	1	7.94	21	8.7	633	
	2	7.84	21	9.0	350		2	8.06	21	8.8	617	
	3	7.74	21	8.7	309		3	8.16	20	8.7	584	
	4	7.57	22	9.1	317		4	7.09	21	9.1	593	
	5	7.77 7.61	21 21	9.8 8.9	314 317		5	7.93 8.01	21 20	9.5 8.8	648 606	
	6	7.70	20	8.8	250		6	7.87	21	8.8	550	
	7	7.68	19	9.4	231		7	7.87	18	9.4	505	
	8						8					
6.25%	1	7.71	21	8.9	435	50%	1	8.23	21	8.7	891	
	2	7.86	21	9.0	421		2	8.37	21	8.7	867	
	3	7.83	21	8.7	384		3	8.43	20	8.8	853	
	4	7.69	22	9.2	399		4	8.25	21	9.1	849	
	5	7.69 7.86	21 21	9.7 8.8	433 420		5	8.21 8.56	21 20	9.4 8.9	927 867	
	6	7.61	21	8.7	331		6	8.12	21	8.8	787	
	7	7.58	18	9.4	305		7	8.17	18	9.4	745	
	8						8					
7.7%	1	7.73	21	8.9	464	100%	1	8.50	21	8.7	1414	
	2	7.88	21	9.0	447		2	8.68	21	8.7	1353	
	3	7.85	20	8.7	395		3	8.69	20	8.9	1346	
	4	7.71	21	9.2	404		4	8.55	21	9.1	1362	
	5	7.72 7.55	21 21	9.6 8.8	443 465		5	8.52 8.58	21 20	9.5 8.8	1496 1300	1361
	6		21	8.7	345		6	8.44	20	8.8	1300	
	7	7.59	18	9.4	315		7	8.53	18	9.6	1232	
	8						8					

RW = RECEIVING WATER

PREPARATION OF DILUTIONS

STUDY: 32593		CLIENT: Ayer	
SPECIES: <i>C. dubia</i>			
Diluent: Receiving Water		$E_0 = 24.5^\circ\text{C}$ $D_0 = 24.4^\circ\text{C}$ Sample: E_0, D_0	
Concentration %	Vol. Eff. (mL)	Final Vol. (mL)	
Lab Control	0	100	
Receiving Water	0	100	
6.25%	6.25	100	
12.5%	12.5	100	
25%	25	100	
50%	50	100	
100%	100	100	
INITIALS:	BG		
TIME:	1425		
DATE:	12/12/19		

PREPARATION of DILUTIONS

STUDY: 32593			CLIENT: Ayer, MA WWTF		
SPECIES: <i>C. dubia</i>			TEST: chronic renewal		
START		Day: 0	Day: 1		Day:
Diluent: RW		Sample: E_0, D_0	Sample: E_1, D_1		Sample:
Concentration	Vol. Eff.	Final Vol.	Vol. Eff.	Final Vol.	Vol. Eff.
MSR	0	200	0	200	
RW	0		0		
6.25%	12.5		12.5		
7.7%	15.4		15.4		
12.5%	25		25		
25%	50		50		
50%	100		100		
100%	200		200		
1st Renewal		Day: 2	Day: 3		Day: 4
Diluent: RW		Sample: E_2, D_2	Sample: E_3, D_3		Sample: E_4, D_4
Concentration	Vol. Eff.	Final Vol.	Vol. Eff.	Final Vol.	Vol. Eff.
MSR	0	200	0	200	0
RW	0		0		0
6.25%	12.5		12.5		12.5
7.7%	15.4		15.4		15.4
12.5%	25		25		25
25%	50		50		50
50%	100		100		100
100%	200		200		200
2nd Renewal		Day: 5	Day: 6		Day:
Diluent: RW		Sample: E_5, D_5	Sample: E_6, D_6		Sample:
Concentration	Vol. Eff.	Final Vol.	Vol. Eff.	Final Vol.	Vol. Eff.
MSR	0	200	0	200	
RW	0		0		
6.25%	12.5		12.5		
7.7%	15.4		15.4		
12.5%	25		25		
25%	50		50		
50%	100		100		
100%	200		200		

Day: 0 $E_0 = 24.4^\circ\text{C}$
 $D_0 = 24.5^\circ\text{C}$

Day: 1 $E_1 = 24.0^\circ\text{C}$
 $D_1 = 23.8^\circ\text{C}$

Day: 2 $E_2 = 24.2^\circ\text{C}$
 $D_2 = 24.4^\circ\text{C}$

Day: 3 $E_3 = 24.1^\circ\text{C}$
 $D_3 = 24.0^\circ\text{C}$

Day: 4 $E_4 = 24.8^\circ\text{C}$
 $D_4 = 24.6^\circ\text{C}$

Day: 5 $E_5 = 24.7^\circ\text{C}$
 $D_5 = 24.8^\circ\text{C}$

Day: 6 $E_6 = 24.8^\circ\text{C}$
 $D_6 = 25.1^\circ\text{C}$

RW = Receiving Water

MSR ID:
 Day 0: 32580, W-1257
 Day 1: 32580, W-1257
 Day 2: 32580, W-1257
 Day 3: 32580, W-1257
 Day 4: 32580, W-1257
 Day 5: 32580, W-1257
 Day 6: 32580, W-1257
 Day 7: _____

RECORD OF METERS USED

STUDY: 32593		CLIENT: AYER	
C. dubia			
Exposure (Hours)			
	0	24	48
Water Quality Station #	1	1	2
Initials / Date	MW 12/12/19	GRS 12/13/19	CA 12/14/19

Water Quality Station #1		Water Quality Station #2		COMMENTS
DO meter #		DO meter #		
DO probe #		DO probe #		
pH meter #		pH meter #		
pH probe #		pH probe #		
S/C meter #		S/C meter #		
S/C probe #		S/C probe #		

RECORD OF METERS USED FOR WATER QUALITY MEASUREMENT

C. dubia

STUDY: 32593		CLIENT: Ayer, MA WWTF							
OLD WATER QUALITIES									
	0	1	2	3	4	5	6	7	8
Water Quality Station #	/	MPO3	1	2	LAG 12/16 22	1	2	2	
Temperature: Thermometer or Probe #	/	MPO3 159 LAG 12/13	159 17/17	1	1	159 17/17	1	1	
Initials	/	LAG	CA	LAG	MSMB	CA	CA	LCI	
NEW WATER QUALITIES									
	0	1	2	3	4	5	6	7	8
Water Quality Station #	2	1	1	1	2	1	2	/	/
Temperature: Thermometer or Probe #	1	159	159	159	1	159	1	/	/
Initials	GRS	GRS	CFS	LAG	LCI	GRS	CFS	/	/
Date	12/12/19	12/12/19	12/14	12/15	12/16	12/17/19	12/18	12/19	

08/12/19

Water Quality Station #1		Water Quality Station #2		COMMENTS
DO meter #	ML01	DO meter #	ML02	
DO probe #	96	DO probe #	160	
pH meter #	ML01	pH meter #	ML02	
pH probe #	168	pH probe #	169	
S/C meter #	ML01	S/C meter #	ML02	
S/C probe #	159	S/C probe #	1	

Report No: 32593
Project: Ayer
SDG:

Sample ID: Effluent Start
Matrix: Water
Sampled: 12/11/19 0630

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Total solids	32593-007	770	10	mg/L	12/18/19 0905	12/19/19 1000	JTP/SM 2540B
Total dissolved solids	32593-007	710	5	mg/L	12/18/19 1420	12/20/19 1205	JTP/SM 2540C
Alkalinity as CaCO3	32593-004	200	20	mg/L	12/16/19 1000	12/16/19 1000	MCS/EPA 310.2
Total organic carbon	32593-003	7.7	0.4	mg/L	12/11/19 1345	12/11/19 1350	MCS/SM 5310 B
Ammonia-N	32593-006	ND	0.1	mg/L as N	12/17/19 1100	12/17/19 1100	MCS/SM 4500-NH3 G
Hardness as CaCO3	32593-005	190	3	mg/L	12/15/19 1245	12/15/19 1725	JLH/ess/SW846 3rd Ed. 6020
Aluminum, total	32593-002	0.035	0.02	mg/L	12/14/19 1230	12/16/19 2044	JLH/EPA 200.8
Cadmium, total	32593-002	ND	0.0003	mg/L	12/14/19 1230	12/16/19 2044	JLH/EPA 200.8
Calcium, total	32593-002	56.7	0.05	mg/L	12/14/19 1230	12/16/19 2044	JLH/EPA 200.8
Copper, total	32593-002	0.0057	0.0005	mg/L	12/14/19 1230	12/16/19 2044	JLH/EPA 200.8
Lead, total	32593-002	0.0003	0.0003	mg/L	12/14/19 1230	12/16/19 2044	JLH/EPA 200.8
Magnesium, total	32593-002	9.3	0.05	mg/L	12/14/19 1230	12/16/19 2044	JLH/EPA 200.8
Nickel, total	32593-002	0.0032	0.001	mg/L	12/14/19 1230	12/16/19 2044	JLH/EPA 200.8
Zinc, total	32593-002	0.023	0.002	mg/L	12/14/19 1230	12/16/19 2044	JLH/EPA 200.8

Sample ID: Effluent First Renewal
Matrix: Water
Sampled: 12/14/19 0750

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO3	32593-017	210	50	mg/L	12/23/19 1500	12/23/19 1500	MCS/EPA 310.2
Ammonia-N	32593-019	ND	0.1	mg/L as N	12/17/19 1100	12/17/19 1100	MCS/SM 4500-NH3 G
Hardness as CaCO3	32593-018	180	3	mg/L	12/15/19 1245	12/15/19 1734	JLH/ess/SW846 3rd Ed. 6020

Sample ID: Effluent Second Renewal
Matrix: Water
Sampled: 12/16/19 0630

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO3	32593-027	150	25	mg/L	12/23/19 1500	12/23/19 1500	MCS/EPA 310.2
Ammonia-N	32593-029	ND	0.1	mg/L as N	12/17/19 1100	12/17/19 1100	MCS/SM 4500-NH3 G
Hardness as CaCO3	32593-028	150	0.3	mg/L	01/10/20 0730	01/10/20 0941	JLH/ess/SW846 3rd Ed. 6020

Notes:

ND = Not Detected

Report No: 32593
Project: Ayer

SDG:

Sample ID: Receiving Water Start
Matrix: Water
Sampled: 12/11/19 0745

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO ₃	32593-011	13	2	mg/L	12/16/19 1000	12/16/19 1000	MCS/EPA 310.2
Total organic carbon	32593-010	6.4	0.4	mg/L	12/11/19 1345	12/11/19 1350	MCS/SM 5310 B
Ammonia-N	32593-013	ND	0.1	mg/L as N	12/17/19 1100	12/17/19 1100	MCS/SM 4500-NH ₃ G
Hardness as CaCO ₃	32593-012	29	3	mg/L	12/15/19 1245	12/15/19 1727	JLH/ess/SW846 3rd Ed. 6020
Aluminum, total	32593-009	0.42	0.02	mg/L	12/14/19 1230	12/16/19 2051	JLH/EPA 200.8
Cadmium, total	32593-009	0.0003	0.0003	mg/L	12/14/19 1230	12/16/19 2051	JLH/EPA 200.8
Calcium, total	32593-009	9.1	0.05	mg/L	12/14/19 1230	12/16/19 2051	JLH/EPA 200.8
Copper, total	32593-009	0.0054	0.0005	mg/L	12/14/19 1230	12/16/19 2051	JLH/EPA 200.8
Lead, total	32593-009	0.0059	0.0003	mg/L	12/14/19 1230	12/16/19 2051	JLH/EPA 200.8
Magnesium, total	32593-009	1.47	0.05	mg/L	12/14/19 1230	12/16/19 2051	JLH/EPA 200.8
Nickel, total	32593-009	0.0014	0.001	mg/L	12/14/19 1230	12/16/19 2051	JLH/EPA 200.8
Zinc, total	32593-009	0.023	0.002	mg/L	12/14/19 1230	12/16/19 2051	JLH/EPA 200.8

Sample ID: Receiving Water First Renewal
Matrix: Water
Sampled: 12/14/19 0750

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO ₃	32593-021	14	2	mg/L	12/16/19 1000	12/16/19 1000	MCS/EPA 310.2
Ammonia-N	32593-023	ND	0.1	mg/L as N	12/17/19 1100	12/17/19 1100	MCS/SM 4500-NH ₃ G
Hardness as CaCO ₃	32593-022	32	3	mg/L	12/15/19 1245	12/15/19 1737	JLH/ess/SW846 3rd Ed. 6020

Sample ID: Receiving Water Second Renewal
Matrix: Water
Sampled: 12/16/19 0855

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Alkalinity as CaCO ₃	32593-031	12	5	mg/L	12/23/19 1500	12/23/19 1500	MCS/EPA 310.2
Ammonia-N	32593-033	ND	0.1	mg/L as N	12/17/19 1100	12/17/19 1100	MCS/SM 4500-NH ₃ G
Hardness as CaCO ₃	32593-032	23	0.3	mg/L	01/10/20 0730	01/10/20 0945	JLH/ess/SW846 3rd Ed. 6020

Notes:

ND = Not Detected

SAMPLE RECEIPT RECORD FOR CHRONIC TOXICITY EVALUATIONS

STUDY #: 32593		CLIENT: AYER	
SAMPLE RECEIPT INFORMATION			
	Start Sample	First Renewal	Second Renewal
Receipt Date & Time:	12/11/19 1000 ⁰⁷⁴⁵	12/14/19 0920	12/16/19 1010
Received By:	RS	BG	LCI
Temperature at Receipt:	1.2°C	6.0°C	0.8°C
Delivered Via:	<input checked="" type="checkbox"/> Enthalpy <input type="checkbox"/> Client <input type="checkbox"/> Courier <input type="checkbox"/> FedEx <input type="checkbox"/> UPS	<input type="checkbox"/> Enthalpy <input checked="" type="checkbox"/> Client <input type="checkbox"/> Courier <input type="checkbox"/> FedEx <input checked="" type="checkbox"/> UPS	<input type="checkbox"/> Enthalpy <input checked="" type="checkbox"/> Client <input type="checkbox"/> Courier <input type="checkbox"/> FedEx <input type="checkbox"/> UPS
Logged In Date & Time:	12/11/19 1600	12/14/19 1655	12/16/19 1200
Logged at Lab By:	GRS	CA	LCI
Temperature at Log In:	5.6°C	6.0°C	0.8°C
SAMPLE CONDITION INFORMATION			
Chain of Custody?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Chain of Custody Signed?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Chain of Custody Complete?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Sample Date?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Sample Time?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Sample Type?	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No	<input checked="" type="radio"/> Yes or No
Custody Seal in Place?	Yes <input checked="" type="radio"/> NA No	Yes <input checked="" type="radio"/> NA No	Yes <input checked="" type="radio"/> NA No
Shipping Container Intact?	<input checked="" type="radio"/> Yes or <input checked="" type="radio"/> No ^{GRS 0745}	<input checked="" type="radio"/> Yes or <input checked="" type="radio"/> No ^{CA 12/14}	<input checked="" type="radio"/> Yes or <input checked="" type="radio"/> No
Client notified of temp?	Yes or <input checked="" type="radio"/> No	Yes or <input checked="" type="radio"/> No	Yes or <input checked="" type="radio"/> No
Sample Arrived on Ice?	Yes or <input checked="" type="radio"/> No	<input checked="" type="radio"/> Yes or <input checked="" type="radio"/> No	<input checked="" type="radio"/> Yes or <input checked="" type="radio"/> No
COMMENTS:	SEE COC	SEE COC	SEE COC



Enthalpy Analytical
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345

Enthalpy Job No: 32593

CHAIN OF CUSTODY DOCUMENTATION

Client: Ayer, Ma WWTF	Contact: Paula Boyle	Project Name: Ayer, MA	Q4 2019
Report to: Paula Boyle	Address: Hoyle Tanner & Assoc Inc	Project Number: P0064	Task: 0001
Invoice to: Paula Boyle	Address: Manchester, NH 03101	Project Manager: Paula Boyle	
Voice: 603-669-5555	Fax: 603-669-4168	email: 0	P.O: '

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
001	Effluent Start	12-10 12-11	0700 0630	AT	C	1	3750	P	4 C	Water	N	CD7DCR, CD48AD StartSample
002	Effluent Start	12-10 12-11	0700 0630	AT	C	1	250	P	HNO3	Water	N	Total Metals Cd,Ni,Pb,Cu,Zn,Al,Ca,Mg;
003	Effluent Start	12-10 12-11	0700 0630	AT	C	1	40	G	4 C	Water	N	TOC
004	Effluent Start	12-10 12-11	0700 0630	AT	C	1	125	P	4 C	Water	N	ALK
005	Effluent Start	12-10 12-11	0700 0630	AT	C	1	125	P	HNO3	Water	N	Metals Hard;
006	Effluent Start	12-10 12-11	0700 0630	AT	C	1	125	P	H2SO4	Water	N	NH3;
007	Effluent Start	12-10 12-11	0700 0630	AT	C	1	500	P	4 C	Water	N	TS,TDS

Relinquished By: <i>[Signature]</i>	Date: 12/11/19	Time: 1000	Received By: <i>[Signature]</i>	Date: 12/11/19	Time: 1000	Temp (C): 11.2
Relinquished By: <i>[Signature]</i>	Date: 12/11/19	Time: 1330	Received at Lab By: <i>[Signature]</i>	Date: 12/11/19	Time: 1330	Temp (C): 5.6°

Comments: Composite Sampling Took Place In 30 Minute Intervals Over A 24 Hour Period, Starting At 0700 On 12/10 and Ending At 0630 On 12/11. 48 Discrete Grabs Were Collected And Combined To Form A Composite.

COC Number: A1018267

Sample Delivery Group No: Dec 2019

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1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345

Enthalpy Job No: 32593

CHAIN OF CUSTODY DOCUMENTATION

Client: Ayer, Ma WWTF	Contact: Paula Boyle	Project Name: Ayer, MA	Q4 2019
Report to: Paula Boyle	Address: Hoyle Tanner & Assoc Inc	Project Number: P0064	Task: 0001
Invoice to: Paula Boyle	Address: Manchester, NH 03101	Project Manager: Paula Boyle	
Voice: 603-669-5555	Fax: 603-669-4168	email: 0	P.O: '

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
008	Receiving Water Start	12/11/19	0745	AT	G	1	3750	P	4 C	Water	N	CD7DCR StartDiluent
009	Receiving Water Start	12/11/19	0745	AT	G	1	250	P	HNO3	Water	N	Total Metals Cd,Ni,Pb,Cu,Zn,Al,Ca,Mg;
010	Receiving Water Start	12/11/19	0745	AT	G	1	40	G	4 C	Water	N	TOC
011	Receiving Water Start	12/11/19	0745	AT	G	1	125	P	4 C	Water	N	Alk
012	Receiving Water Start	12/11/19	0745	AT	G	1	125	P	HNO3	Water	N	Metals Hard;
013	Receiving Water Start	12/11/19	0745	AT	G	1	125	P	H2SO4	Water	N	NH3;

Relinquished By: <i>[Signature]</i>	Date: 12/11/19	Time: 1000	Received By: <i>[Signature]</i>	Date: 12/11/19	Time: 1000	Temp (C): 1.2
Relinquished By: <i>[Signature]</i>	Date: 12/11/19	Time: 1330	Received at Lab By: <i>[Signature]</i>	Date: 12/11/19	Time: 1330	Temp (C): 5.6°C
Comments: RECEIVING WATER WAS TAKEN FROM THE NASHUA RIVER OFF OF MACPHERSON ROAD IN AYER, MA.						

COC Number: A1018267

Sample Delivery Group No: Dec 2019

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Enthalpy Analytical
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345

Enthalpy Job No: 32593

CHAIN OF CUSTODY DOCUMENTATION

Client: Ayer, Ma WWTF	Contact: Paula Boyle	Project Name: Ayer, MA <i>Q4 2019</i>	
Report to: Paula Boyle	Address: Hoyle Tanner & Assoc Inc	Project Number: P0064	Task: 0001
Invoice to: Paula Boyle	Address: Manchester, NH 03101	Project Manager: Paula Boyle	
Voice: 603-669-5555	Fax: 603-669-4168	email: 0	P.O: '

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
014	Effluent First Renewal	<i>12-13</i> <i>12-14</i>	<i>0820</i> <i>0750</i>	<i>TW</i>	<i>C</i>	1	3750	P	4 C	Water	N	CD7DCR 1stRenewal Sample
015	Effluent First Renewal	<i>12-13</i> <i>12-14</i>	<i>0820</i> <i>0750</i>	<i>TW</i>	<i>C</i>	1	250	P	HNO3	Water	N	Total Metals Cd,Ni,Pb,Cu,Zn,Al,Ca,Mg;
016	Effluent First Renewal	<i>12-13</i> <i>12-14</i>	<i>0820</i> <i>0750</i>	<i>TW</i>	<i>C</i>	1	40	G	4 C	Water	N	TOC
017	Effluent First Renewal	<i>12-13</i> <i>12-14</i>	<i>0820</i> <i>0750</i>	<i>TW</i>	<i>C</i>	1	125	P	4 C	Water	N	Alk
018	Effluent First Renewal	<i>12-13</i> <i>12-14</i>	<i>0820</i> <i>0750</i>	<i>TW</i>	<i>C</i>	1	125	P	HNO3	Water	N	Metals Hard;
019	Effluent First Renewal	<i>12-13</i> <i>12-14</i>	<i>0820</i> <i>0750</i>	<i>TW</i>	<i>C</i>	1	125	P	H2SO4	Water	N	NH3;
020	Receiving Water First Renewal	<i>12/13/19</i>	<i>0900</i>	<i>AT</i>	<i>G</i>	1	3750	P	4 C	Water	N	CD7DCR 1stRenewal Diluent
021	Receiving Water First Renewal	<i>12/13/19</i>	<i>0900</i>	<i>AT</i>	<i>G</i>	1	125	P	4 C	Water	N	Alk
022	Receiving Water First Renewal	<i>12/13/19</i>	<i>0900</i>	<i>AT</i>	<i>G</i>	1	125	P	HNO3	Water	N	Metals Hard;
023	Receiving Water First Renewal	<i>12/13/19</i>	<i>0900</i>	<i>AT</i>	<i>G</i>	1	125	P	H2SO4	Water	N	NH3;

Relinquished By: <i>[Signature]</i>	Date: <i>12-14-19</i>	Time: <i>09:20</i>	Received By: <i>[Signature]</i>	Date: <i>12/14/19</i>	Time: <i>0920</i>	Temp (C): <i>6.0°C</i>
Comments: <i>Effluent composite collected in 30 minute intervals from 0820 12-13-19 through 0750 12-14-19. 98 Total Grab samples taken over 24 hr Effluent composite collection period.</i>						

COC Number: A1018268

Sample Delivery Group No: Dec 2019	Page <i>1</i> of <i>1</i>
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Receiving water collected upstream of Effluent discharge pipe from Nashua River off of MacPherson Rd.

Ayer Massachusetts WWTF Effluent Evaluation, December 2019.

Data Appendix Page 29



CHAIN OF CUSTODY DOCUMENTATION

Client: Ayer, Ma WWTF	Contact: Paula Boyle	Project Name: Ayer, MA	24 2019
Report to: Paula Boyle	Address: Hoyle Tanner & Assoc Inc	Project Number: P0064	Task: 0001
Invoice to: Paula Boyle	Address: Manchester, NH 03101	Project Manager: Paula Boyle	
Voice: 603-669-5555	Fax: 603-669-4168	email: 0	P.O: '

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com- posite (G/C)	No	Container Size (mL)	Type (P/G/T)	Field Preser- vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested/ Special Instructions:
024	Effluent Second Renewal	12-15	0700	TW	C	1	3750	P	4 C	Water	N	CD7DCR 2ndRenewal Sample
025	Effluent Second Renewal	12-16	0700	TW	C	1	250	P	HNO3	Water	N	Total Metals Cd,Ni,Pb,Cu,Zn,Al,Ca,Mg;
026	Effluent Second Renewal	12-16	0700	TW	C	1	40	G	4 C	Water	N	TOC
027	Effluent Second Renewal	12-16	0700	TW	C	1	125	P	4 C	Water	N	Alk
028	Effluent Second Renewal	12-16	0700	TW	C	1	125	P	HNO3	Water	N	Metals Hard;
029	Effluent Second Renewal	12-16	0700	TW	C	1	125	P	H2SO4	Water	N	NH3;
030	Receiving Water Second Renewal	12-16	0855	TW	G	1	3750	P	4 C	Water	N	CD7DCR 2ndRenewal Diluent
031	Receiving Water Second Renewal	12-16	0855	TW	G	1	125	P	4 C	Water	N	Alk
032	Receiving Water Second Renewal	12-16	0855	TW	G	1	125	P	HNO3	Water	N	Metals Hard;
033	Receiving Water Second Renewal	12-16	0855	TW	G	1	125	P	H2SO4	Water	N	NH3;

Relinquished By: *[Signature]* Date: 12-16-19 Time: 10:10 Received By: _____ Date: _____ Time: _____ Temp (C): _____

Relinquished By: _____ Date: _____ Time: _____ Received at Lab By: *haver cloning* Date: 12/16/19 Time: 10:10 Temp (C): 0.8°C

Comments: *Effluent Composite collected in 30 minute intervals from 0700 12-15-19 through 06:30 12-16-19. 48 Total Effluent grab samples taken over 24 hr Effluent composite collection period.*

COC Number: A1018269

Sample Delivery Group No: Dec 2019

Page 1 of 1

Receiving Water sample collected upstream of Effluent discharge pipe from Nashua River off of MacPherson Rd.

Assay Review Checklist

DATE IN: 12/11/19

STUDY#: 32593

DATE DUE: 01/30/20

CLIENT: AYER

PROJECT:

ASSAY: CD48AD, CDTPCR

Project Paperwork Check for Completeness				
	Date	Analyst	Supervisor	Comments
Day 0	12/12/19	MS	GRS	
Day 1	12/13	LAG		
Day 2	12/14	CA		
Day 3	12/15	LAG	GRS	
Day 4	12/16	MS		
Day 5	12/17	CA		
Day 6	12/18	CA		
Day 7	12/19	LCI		
Day 8				

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete	01/04/20	DL	
Sample Receipt Complete		↓	
Organism Culture Sheet(s)		NA	
Bench Sheets Complete (dates, times, initials, etc...)		DL	
Water Quality Data Complete		↓	
TRC Values & Bottle Numbers		↓	
Daphnid Calculations Complete		↓	
Weights Reported		NA	
Assay Acceptability Review	↓	DL	

Technical Report Review	Date	Initials	Comments
Statistical Analysis Complete	12/24/19	MW	
Statistical Analysis Reviewed	01/10/20	JTP	
Data Acceptability Review	12/24/19	MW	
Supporting Chemistry Report	1/14/20	MW	
Draft Report	12/24/19	MW	
QA Audit/Review Complete			
Final Report Reviewed	01/13/20	JTP	
Final Report Printed - PDF	1/15/20	MW	
Executive Summary / Chems Sent			
Report E-mailed / Faxed	1/15/20	MW	
Report Logged Out / Invoice Sent	↓	↓	
Report Scanned to Archive	↓	↓	

APPENDIX F

SIU ENFORCEMENT

DEPARTMENT OF PUBLIC WORKS

Water, Wastewater, Highway, Solid Waste & Stormwater Divisions

Mark L. Wetzel, P.E., Superintendent
Pamela J. Martin, Office Manager

25 BROOK STREET
AYER, MASSACHUSETTS 01432
T: (978) 772-8240
F: (978) 772-8244

November 10, 2020

Certified Mail No. 7010 1060 0000 8784 6558

Mr. Daniel Gray, General Manager
CPF - NEHF
25 Copeland Drive
Ayer, Massachusetts 01432

Re: NOTICE OF VIOLATION 005-020-03

NON-COMPLIANCE SUMMARY

NAME OF ENTITY IN NONCOMPLIANCE

CPF, Inc.

LOCATION WHERE NONCOMPLIANCE OCCURED OR WAS OBSERVED

25 Copeland Drive
Ayer, MA 01432

VIOLATION SUMMARY

Industrial Discharge Parameter	Date	Reported Value	Description of Violation
BOD ₅	10/7/20	958 lbs./day	Discharge exceeded permitted limit of 800 lbs./day

CPF, Inc. has acknowledged being out of compliance with Industrial Discharge Permit no. 005. CPF, Inc. notified the Pretreatment Coordinator's Consultant during and inspection on November 3, 2020 of this incident and followed up with the attached letter.

ACTION TO BE TAKEN AND THE DEADLINE FOR TAKING SUCH ACTION

The Town fully expects CPF, Inc. to remain in full compliance with Industrial Discharge Permit 005.

NOTICE

Any additional violation of the Town's Industrial Pretreatment Program may result in the Town escalating enforcement response to civil action. The Town has the authority to begin to assess fines per day for each violation detected and to ultimately terminate wastewater discharges to the publicly owned treatment works.

Should you have any questions or concerns regarding this matter, please do not hesitate to contact the Office of the Town's Pretreatment Coordinator's Consultant, Ms. Paula M. Boyle, at (603) 669-5555 extension 163.

TOWN OF AYER

A handwritten signature in blue ink, appearing to read "Mark Wetzel", with a stylized flourish at the end.

Mark L. Wetzel, P.E.,
Superintendent

cc: *Paula M. Boyle, Pretreatment Coordinator's Consultant*
Pretreatment

DEPARTMENT OF PUBLIC WORKS

Water, Wastewater, Highway, Solid Waste & Stormwater Divisions

Mark L. Wetzel, P.E., Superintendent
Pamela J. Martin, Office Manager

25 BROOK STREET
AYER, MASSACHUSETTS 01432
T: (978) 772-8240
F: (978) 772-8244

October 13, 2020

Certified Mail No. 7017 2680 0000 6756 4500

Mr. Daniel Gray, General Manager
CPF - NEHF
25 Copeland Drive
Ayer, Massachusetts 01432

Re: NOTICE OF VIOLATION 005-020-02

NON-COMPLIANCE SUMMARY

NAME OF ENTITY IN NONCOMPLIANCE

CPF, Inc.

LOCATION WHERE NONCOMPLIANCE OCCURED OR WAS OBSERVED

25 Copeland Drive
Ayer, MA 01432

VIOLATION SUMMARY

Industrial Discharge Parameter	Date	Reported Value	Description of Violation
BOD ₅	9/16/20	1,175 lbs./day	Discharge exceeded permitted limit of 800 lbs./day

CPF, Inc. has acknowledged being out of compliance with Industrial Discharge Permit no. 005. CPF, Inc. contacted the Pretreatment Coordinator's Consultant by email on October 9, 2020 explaining this incident.

ACTION TO BE TAKEN AND THE DEADLINE FOR TAKING SUCH ACTION

The Town fully expects CPF, Inc. to remain in full compliance with Industrial Discharge Permit 005.

NOTICE

Any additional violation of the Town's Industrial Pretreatment Program may result in the Town escalating enforcement response to civil action. The Town has the authority to begin to assess fines per day for each violation detected and to ultimately terminate wastewater discharges to the publicly owned treatment works.

Should you have any questions or concerns regarding this matter, please do not hesitate to contact the Office of the Town's Pretreatment Coordinator's Consultant, Ms. Paula M. Boyle, at (603) 669-5555 extension 163.

TOWN OF AYER



Mark L. Wetzel, P.E.,
Superintendent

cc: *Paula M. Boyle, Pretreatment Coordinator's Consultant*
Pretreatment

DEPARTMENT OF PUBLIC WORKS

Water, Wastewater, Highway, Solid Waste & Stormwater Divisions

Mark L. Wetzel, P.E., Superintendent
Pamela J. Martin, Office Manager

25 BROOK STREET
AYER, MASSACHUSETTS 01432
T: (978) 772-8240
F: (978) 772-8244

NOTICE OF VIOLATION

October 13, 2020

Certified Mail No. 7017 2680 0000 6756 4517.

Nasoya Foods, Inc.
One New England Way
Ayer, Massachusetts 01432

Re: Notice of Violation

Attn: Mr. Justin Lee

NONCOMPLIANCE SUMMARY

NAME OF ENTITY IN NONCOMPLIANCE

Nasoya Foods, Inc., LLC

LOCATION WHERE NONCOMPLIANCE OCCURRED OR WAS OBSERVED

One New England Way
Ayer, MA 01432

VIOLATION SUMMARY

Date	Parameter	Reported/Permit limit lbs./day	Violation
9/17/20	BOD ₅	1,218 /750	Permit exceedance for BOD ₅
9/29/20	BOD ₅	1,158 /750	Permit exceedance for BOD ₅

Nasoya has explained these incidents in the attached slug report form submitted by email on October 7, 2020.

ACTION TO BE TAKEN AND THE DEADLINE FOR TAKING SUCH ACTION

1. Nasoya Foods must remain in compliance with Industrial Discharge Permit No. 016 at all times.

NOTICE

Any additional violation of the Town's Industrial Pretreatment Program may result in the Town escalating enforcement response to civil action. The Town has the authority to begin to assess fines per day for each violation detected and to ultimately terminate wastewater discharges to the publicly owned treatment works.

Should you have any questions or concerns regarding this matter, please do not hesitate to contact the Office of the Town's Pretreatment Coordinator's Consultant, Ms. Paula M. Boyle, at (603) 669-5555 extension 163.

TOWN OF AYER

A handwritten signature in blue ink, appearing to read "Mark L. Wetzel".

Mark L. Wetzel, P.E.,
Superintendent

cc: *Paula M. Boyle, Pretreatment Coordinator's Consultant*
Pretreatment Files

DEPARTMENT OF PUBLIC WORKS

Water, Wastewater, Highway, Solid Waste & Stormwater Divisions

Mark L. Wetzel, P.E., Superintendent
Pamela J. Martin, Office Manager

25 BROOK STREET
AYER, MASSACHUSETTS 01432
T: (978) 772-8240
F: (978) 772-8244

September 11, 2020

Certified Mail No. 7010 1060 0000 8784 7111

Mr. Daniel Gray, General Manager
CPF - NEHF
25 Copeland Drive
Ayer, Massachusetts 01432

Re: NOTICE OF VIOLATION 005-020-01

NON-COMPLIANCE SUMMARY

NAME OF ENTITY IN NONCOMPLIANCE

CPF, Inc.

LOCATION WHERE NONCOMPLIANCE OCCURED OR WAS OBSERVED

25 Copeland Drive
Ayer, MA 01432

VIOLATION SUMMARY

Industrial Discharge Parameter	Date	Reported Value	Description of Violation
BOD ₅	8/6/20	1,041 lbs./day	Discharge exceeded permitted limit of 800 lbs./day

CPF, Inc. has acknowledged being out of compliance with Industrial Discharge Permit no. 005. CPF, Inc. contacted the Pretreatment Coordinator's Consultant by email on September 1, 2020 and followed up with a letter explaining this incident attached hereto.

ACTION TO BE TAKEN AND THE DEADLINE FOR TAKING SUCH ACTION

The Town fully expects CPF, Inc. to remain in full compliance with Industrial Discharge Permit 005.

NOTICE

Any additional violation of the Town's Industrial Pretreatment Program may result in the Town escalating enforcement response to civil action. The Town has the authority to begin to assess fines per day for each violation detected and to ultimately terminate wastewater discharges to the publicly owned treatment works.

Should you have any questions or concerns regarding this matter, please do not hesitate to contact the Office of the Town's Pretreatment Coordinator's Consultant, Ms. Paula M. Boyle, at (603) 669-5555 extension 163.

TOWN OF AYER



Mark L. Wetzel, P.E.,
Superintendent

cc: *Paula M. Boyle, Pretreatment Coordinator's Consultant*
Pretreatment

Mark L. Wetzel, P.E., Superintendent
Pamela J. Martin, Office Manager

25 BROOK STREET
AYER, MASSACHUSETTS 01432
T: (978) 772-8240
F: (978) 772-8244

NOTICE OF VIOLATION

June 8, 2020

Certified Mail No. 7010 1060 0000 8784 6572

EPIC Enterprises, Inc.
11 Copeland Drive
Ayer, Massachusetts 01432

Re: Notice of Violation

Mr. Timothy Duprey:

NONCOMPLIANCE SUMMARY

NAME OF ENTITY IN NONCOMPLIANCE

EPIC Enterprises, Inc.

LOCATION WHERE NONCOMPLIANCE OCCURRED OR WAS OBSERVED

11 Copeland Drive
Ayer, MA 01432

VIOLATION SUMMARY

Date	Parameter	Reported/Permit limit lbs/day	Violation
May 27, 2020	BOD ₅	540/400	Exceeded BOD ₅ limit

Epic Enterprises, Inc. informed the Town immediately upon detection of the Industrial Discharge Permit violation.

ACTION TO BE TAKEN AND THE DEADLINE FOR TAKING SUCH ACTION

1. Epic Enterprises must remain in compliance with Industrial Discharge Permit No. 016 at all times.

2. EPIC Enterprises must conduct an assessment of the cleaning waters operation to be sure the cleaning waters operations are not contributing to the BOD₅ permit exceedances. The assessment must be submitted in a letter no later than June 19, 2020 to the office of the Pretreatment Coordinator's Consultant, Ms. Paula M. Boyle at pboyle@hoyletanner.com.

NOTICE

1. Any additional violation of the Town's Industrial Pretreatment Program may result in the Town escalating enforcement response to civil action. The Town has the authority to assess civil penalties in at least the amount of \$1,000 a day per violation.

Should you have any questions or concerns regarding this matter, please do not hesitate to contact the Office of the Town's Pretreatment Coordinator's Consultant, Ms. Paula M. Boyle, at (603) 669-5555 extension 163.

TOWN OF AYER

A handwritten signature in blue ink, appearing to read "Mark L. Wetzel".

Mark L. Wetzel, P.E.,
Superintendent

cc: *Paula M. Boyle, Pretreatment Coordinator's Consultant*
Pretreatment Files

Mark L. Wetzel, P.E., Superintendent
Pamela J. Martin, Office Manager

25 BROOK STREET
AYER, MASSACHUSETTS 01432
T: (978) 772-8240
F: (978) 772-8244

NOTICE OF VIOLATION

June 8, 2020

Certified Mail No. 7010 1060 0000 8784 6572

EPIC Enterprises, Inc.
11 Copeland Drive
Ayer, Massachusetts 01432

Re: Notice of Violation

Mr. Timothy Duprey:

NONCOMPLIANCE SUMMARY

NAME OF ENTITY IN NONCOMPLIANCE

EPIC Enterprises, Inc.

LOCATION WHERE NONCOMPLIANCE OCCURRED OR WAS OBSERVED

11 Copeland Drive
Ayer, MA 01432

VIOLATION SUMMARY

Date	Parameter	Reported/Permit limit lbs/day	Violation
May 27, 2020	BOD ₅	540/400	Exceeded BOD ₅ limit

Epic Enterprises, Inc. informed the Town immediately upon detection of the Industrial Discharge Permit violation.

ACTION TO BE TAKEN AND THE DEADLINE FOR TAKING SUCH ACTION

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NOTICE

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Should you have any questions or concerns regarding this matter, please do not hesitate to contact the Office of the Town's Pretreatment Coordinator's Consultant, Ms. Paula M. Boyle, at (603) 669-5555 extension 163.

TOWN OF AYER

A handwritten signature in blue ink, appearing to read "Mark Wetzel", with a stylized flourish at the end.

Mark L. Wetzel, P.E.,
Superintendent

cc: *Paula M. Boyle, Pretreatment Coordinator's Consultant*
Pretreatment Files

DEPARTMENT OF PUBLIC WORKS

Water, Wastewater, Highway, Solid Waste & Stormwater Divisions

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Pamela J. Martin, Office Manager

25 BROOK STREET
AYER, MASSACHUSETTS 01432
T: (978) 772-8240
F: (978) 772-8244

NOTICE OF VIOLATION

March 6, 2020

Certified Mail No. 7017 2680 0000 6756 4418

EPIC Enterprises, Inc.
11 Copeland Drive
Ayer, Massachusetts 01432

Re: Notice of Violation

Mr. Timothy Duprey:

NONCOMPLIANCE SUMMARY

NAME OF ENTITY IN NONCOMPLIANCE

EPIC Enterprises, Inc.

LOCATION WHERE NONCOMPLIANCE OCCURRED OR WAS OBSERVED

11 Copeland Drive
Ayer, MA 01432

VIOLATION SUMMARY

Date	Parameter	Reported/Permit limit lbs/day	Violation
February 26, 2020	BOD ₅	580/400	Exceeded BOD ₅ limit

ACTION TO BE TAKEN AND THE DEADLINE FOR TAKING SUCH ACTION

1. Epic Enterprises must remain in compliance with Industrial Discharge Permit No. 016 at all times.

NOTICE

Any additional violation of the Town's Industrial Pretreatment Program may result in the Town escalating enforcement response to civil action. The Town has the authority to begin to assess fines per day for each violation detected and to ultimately terminate wastewater discharges to the publicly owned treatment works.

Should you have any questions or concerns regarding this matter, please do not hesitate to contact the Office of the Town's Pretreatment Coordinator's Consultant, Ms. Paula M. Boyle, at (603) 669-5555 extension 163.

TOWN OF AYER

A handwritten signature in blue ink, reading "Mark Wetzel". The signature is stylized with a large "M" and a long, sweeping underline.

Mark L. Wetzel, P.E.,
Superintendent

cc: *Paula M. Boyle, Pretreatment Coordinator's Consultant*
Pretreatment Files

DEPARTMENT OF PUBLIC WORKS

Water, Wastewater, Highway, Solid Waste & Stormwater Divisions

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Pamela J. Martin, Office Manager

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F: (978) 772-8244

NOTICE OF VIOLATION

March 6, 2020

Certified Mail No. 7017 2680 0000 6756 4333

Nasoya Foods, Inc.
One New England Way
Ayer, Massachusetts 01432

Re: Notice of Violation

Attn: Mr. Justin Lee

NONCOMPLIANCE SUMMARY

NAME OF ENTITY IN NONCOMPLIANCE

Nasoya Foods, Inc., LLC

LOCATION WHERE NONCOMPLIANCE OCCURRED OR WAS OBSERVED

One New England Way
Ayer, MA 01432

VIOLATION SUMMARY

Date	Parameter	Reported/Permit limit lbs./day	Violation
2/6//2019-2/7/209	BOD ₅	1,441/750	Permit exceedance for BOD ₅

ACTION TO BE TAKEN AND THE DEADLINE FOR TAKING SUCH ACTION

1. Nasoya Foods must remain in compliance with Industrial Discharge Permit No. 016 at all times.

NOTICE

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TOWN OF AYER



Mark L. Wetzel, P.E.,
Superintendent

cc: *Paula M. Boyle, Pretreatment Coordinator's Consultant*
Pretreatment Files